

TIGHT BINDING BOOK

UNIVERSAL
LIBRARY

OU_148555

UNIVERSAL
LIBRARY

OSMANIA UNIVERSITY LIBRARY

Call No. 528.1
N - A
Author Nautical Almanac Office U.S.A.
Title Nautical Almanac.

This book should be returned on or before the date last marked below.

THE
AMERICAN EPHEMERIS
AND
NAUTICAL ALMANAC,
FOR THE YEAR
1923

PUBLISHED BY THE NAUTICAL ALMANAC OFFICE, U. S.
NAVAL OBSERVATORY, BY DIRECTION OF THE SECRETARY
OF THE NAVY AND UNDER THE AUTHORITY OF CONGRESS.
SOLD BY THE SUPERINTENDENT OF DOCUMENTS,
GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C.
PRICE ONE DOLLAR



U. S. NAVAL OBSERVATORY.

Rear Admiral J. A. HOOGEWERFF, *U. S. N.*, *Superintendent.*

checked 1975

ASTRONOMICAL COUNCIL.

The Superintendent.	Lt. Comdr. A. HALL (Math.), <i>U. S. N.</i>
Captain G. E. GELM, <i>U. S. N.</i>	Astronomer J. C. HAMMOND.
Capt. W. S. EICHELBERGER, <i>U. S. N.</i>	Astronomer G. A. HILL.
Comdr. F. B. LITTELL (Math.), <i>U. S. N.</i>	Assistant Astronomer H. R. MORGAN.

DEPARTMENT OF THE NAUTICAL ALMANAC.

Captain W. S. EICHELBERGER (Math.), *U. S. N.* *Director.*

ASSISTANTS

JAMES ROBERTSON.	ARTHUR NEWTON.
WILLIAM T. CARRIGAN.	PEREZ FISCH.
ARTHUR SNOW.	GEORGE F. CRAWLEY.
WALTER M. HAMILTON.	CLIFFORD S. LEWIS.

CATHERINE DE M. LEWIS.

PIECEWORKERS.

<i>Janet McWilliam.</i>	<i>Henry B. Hedrick.</i>
<i>Hannah F. M. Hedrick.</i>	<i>Thomas E. Trott.</i>
<i>Alfred Doolittle.</i>	<i>Isabel M. Lewis.</i>

NOTE.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.

July, 1920.

PREFACE.

This volume of the *American Ephemeris and Nautical Almanac*, the eighth to be issued under the international agreement resulting from the *Congrès International des Éphémérides Astronomiques* held at Paris in October, 1911, was prepared under the immediate supervision of Captain W. S. EICHELBERGER, Corps of Professors of Mathematics, U. S. N., the Director. The character of the matter herein contained and its arrangement are the same as in the immediately preceding volume.

The naval appropriation bill approved August 22, 1912, contained the following:

The Secretary of the Navy is hereby authorized to arrange for the exchange of data with such foreign almanac offices as he may from time to time deem desirable, with a view to reducing the amount of duplication of work in preparing the different national nautical and astronomical almanacs and increasing the total data which may be of use to navigators and astronomers available for publication in the *American Ephemeris and Nautical Almanac*: *Provided*, That any such arrangement shall be terminable on one year's notice: *Provided further*, That the work of the Nautical Almanac Office during the continuance of any such arrangement shall be conducted so that in case of emergency the entire portion of the work intended for the use of navigators may be computed by the force employed by that office, and without any foreign cooperation whatsoever: *Provided further*, That any employee of the Nautical Almanac Office who may be authorized in any annual appropriation bill and whose services in whole or in part can be spared from the duty of preparing for publication the annual volumes of the *American Ephemeris and Nautical Almanac* may be employed by said office in the duty of improving the tables of the planets, moon, and stars, to be used in preparing for publication the annual volumes of the office: *Provided further*, That section four hundred and thirty-five, Revised Statutes, is hereby repealed.

The Greenwich ephemerides of the Sun, Moon, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Neptune were furnished by the office of the British *Nautical Almanac*.

The conjunctions, phenomena, and configurations of Jupiter's satellites I-IV and the apparent places for Greenwich transit of 38 circumpolar stars were furnished by the office of the *Connaissance des Temps*.

The apparent places for Greenwich transit of 121 ten-day stars were furnished by the office of the *Almanaque Nautico*.

The apparent places for Greenwich transit of 137 ten-day stars were furnished by the office of the *Annuario Astronomico di Torino*.

In accordance with the recommendations of the *Congrès International des Éphémérides Astronomiques*, most of the material furnished from abroad is based upon tables prepared in the American Nautical Almanac Office. In the Introduction are mentioned the various tables upon which the different ephemerides are based.

The following computations were made by the American Nautical Almanac Office:

In Part I, all the hourly and daily variations for the quantities furnished from abroad except in the case of the right ascension and declination of the Moon.

In Part II, the quantities used in computing the apparent places of the stars from their mean places; the mean place list; the interpolation of the apparent places of 214 stars from transit at Greenwich to transit at Washington; the apparent places of 611 stars; the interpolation of the ephemerides of the Sun, Moon, and planets from Greenwich noon to transit at Washington; the stellar magnitudes of the planets.

In Part III, the data relating to the eclipses of the Sun and Moon; the data relating to the occultations of stars and planets by the Moon; the ephemerides for physical observations of the Sun, Moon, Mars, and Jupiter; the elements of the illuminated disks of Mercury and Venus; the stellar magnitudes of the planets; the data concerning the satellites of the planets except Jupiter's satellites I-IV; the diagrams of the satellite orbits; the list of phenomena; the list of observatories with their geographical coordinates; the tables for the determination of latitude and azimuth from observations of Polaris; and the tables for the determination of the time of the rising and setting of the Sun and Moon.

All computations made in the American Nautical Almanac Office and those received from the other offices were subjected to checks to insure absence of errors.

J. A. HOOGEWERFF,
Rear Admiral, U. S. Navy,
Superintendent Naval Observatory.

WASHINGTON, *July, 1920.*

CONTENTS.

	Page.
Errata	vi
Introduction	vii
Anniversaries and Festivals	xiv
Chronological Eras and Cycles	xv
Astronomical Constants	xvi
Symbols and Abbreviations	xviii

PART I—EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Ephemeris of the Sun	2
Ephemeris of the Moon	26
Phases of the Moon	117
Ephemerides of the Planets Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune	134

PART II—EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

BESSEL's Formulæ for Star-Reductions	200
Besselian and Independent Star-Numbers	202
Nutation, Terms of Short Period in the	215
Mean Places of 790 Standard Stars for 1923.0	217
Mean Places of 35 Circumpolar Stars for 1923.0	231
Apparent Places of 35 Circumpolar Stars	232
Apparent Places of 790 Standard Stars	316
Ephemeris of the Sun for Apparent Noon	514
Moon-Culminations	522
Transit-Ephemerides of the Planets Mercury, Venus, Jupiter, Saturn, Uranus, Neptune	538

PART III- PHENOMENA.

Eclipses	556
Mean Places of Stars Occulted by the Moon	564
Elements for the Prediction of Occultations	568
Occultations Visible at Washington	608
Ephemeris for Physical Observations of the Sun	612
Moon, Mean Equator, Orbit, and Mean Longitude	613
Ephemeris for Physical Observations of the Moon	614
Disks of Mercury and Venus	622
Ephemeris for Physical Observations of Mars	624
Ephemeris for Physical Observations of Jupiter	626
Satellites of Jupiter, Saturn, Uranus, and Neptune	630
Phenomena, Planetary Configurations	670
Positions of Observatories	672
Problems in Lunar Distances	684

TABLES.

Table I—For finding the Latitude by an Observed Altitude of Polaris	685
Table Ia—Auxiliary Table of Corrections for Latitudes other than 45°	689
Table II—Sidereal into Mean Solar Time	690
Table III—Mean Solar into Sidereal Time	693
Table IV—Azimuth of Polaris at all Hour Angles	696
Table IVa—Correction for Declination	701
Table V—Azimuth of Polaris at Elongation	702
Table Va—For Reduction of Observations Near Elongation	707
Table VI—For Finding the Times of Upper and Lower Culmination of Polaris	708
Table VII—Apparent Place, Upper Culmination, and Elongations, of Polaris	709
Table VIII—Sunrise and Sunset for Northern Latitudes	710
Table IX—Sunrise and Sunset for Southern Latitudes	726
Table X—Moonrise and Moonset	728

On the Arrangement and Use of <i>The American Ephemeris and Nautical Almanac</i>	745
Index to Apparent Places of Stars	771
General Index	775

ERRATA.

The American Ephemeris, 1921.

Page.

670 Ottawa, Canada, Longitude *for* 51°.95 *read* 51°.98

The American Ephemeris, 1922.

682 Ottawa, Canada, Longitude *for* 51°.95 *read* 51°.98

INTRODUCTION.

The ephemeris of the Sun is constructed from NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is 8''.80, *Paris Conference, May, 1896*.

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3 R \beta \\ Z &= R \sin \lambda \sin \omega + 44.5 R \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= + Y \sec \omega \Delta \lambda \sin 1'' \\ \Delta Y &= -X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9.1 \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= -X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21.9 \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

- R = the Sun's distance from the Earth,
- λ = the Sun's true longitude,
- β = the Sun's true latitude, expressed in seconds of arc,
- ω = the obliquity of the ecliptic,
- $\Delta \lambda$ = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
- $\Delta \omega$ = the reduction of the mean to the apparent obliquity,
- τ = the fraction of the year since the beginning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from BROWN'S new *Tables of the Motion of the Moon* (in manuscript).

The ephemerides of Mercury, Venus, and Mars are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4. Corrections derived from *Astronomical Papers of the American Ephemeris*, Vol. IX, part 2, have been applied to the ephemeris of Mars.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by GEORGE W. HILL, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from NEWCOMB'S tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of NEWCOMB'S *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1. The formulæ from which this nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{array}{ll}
 \delta\psi = -(17''.234 + 0''.017 T) \sin \Omega & \delta\epsilon = +9''.214 \cos \Omega \\
 + 0''.209 \sin 2 \Omega & -0''.090 \cos 2 \Omega \\
 - 1''.257 \sin 2 L & +0''.546 \cos 2 L \\
 - 0''.049 \sin (3 L + 78^\circ.7) & +0''.021 \cos (3 L + 78^\circ.7) \\
 + 0''.110 \sin (L + 75^\circ.3) & -0''.009 \cos (L - 78^\circ.7)
 \end{array}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers are as follows:

Terms of Long Period.	Terms of Short Period.
$\delta\psi = -(17''.234 + 0''.017 T) \sin \Omega$	$-0''.204 \sin 2 \mathcal{C}$
$+ 0''.209 \sin 2 \Omega$	$+0''.011 \sin (\mathcal{C} + \Gamma')$
$- 1''.272 \sin 2 L$	$+0''.068 \sin (\mathcal{C} - \Gamma')$
$+ 0''.126 \sin (L - \Gamma)$	$-0''.034 \sin (2 \mathcal{C} - \Omega)$
$- 0''.050 \sin (3 L - \Gamma')$	$-0''.026 \sin (3 \mathcal{C} - \Gamma')$
$+ 0''.021 \sin (L + \Gamma)$	$+0''.015 \sin (\mathcal{C} - 2 L + \Gamma')$
$+ 0''.012 \sin (2 L - \Omega)$	$+0''.006 \sin 2 (\mathcal{C} - L)$
$\delta\epsilon = + (9''.210 + 0''.0009 T) \cos \Omega$	$+0''.088 \cos 2 \mathcal{C}$
$- 0''.090 \cos 2 \Omega$	$+0''.018 \cos (2 \mathcal{C} - \Omega)$
$+ 0''.551 \cos 2 L$	$+0''.011 \cos (3 \mathcal{C} - \Gamma')$
$+ 0''.022 \cos (3 L - \Gamma)$	$-0''.005 \cos (\mathcal{C} + \Gamma')$
$- 0''.009 \cos (L + \Gamma)$	
$- 0''.007 \cos (2 L - \Omega)$	

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars are explained on pages 200 and 201. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from NEWCOMB'S *Catalogue of Fundamental Stars, Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2.

In general, the names of the stars are the same as in NEWCOMB'S Suggested List of Fundamental Stars, except that the FLAMSTEED number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of HEIS or GOULD have been used. In all such cases, H¹ or the letter G precedes the constellation name, as, for example, 5 H¹. Cassiopeiæ and 38 G. Horologii.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

The spectral classification has been furnished by the Harvard College Observatory. The notation is that of *Annals of Harvard College Observatory*, Vol. LVI.

The mean places, annual variations, and annual proper motions of the stars have been taken from NEWCOMB'S Catalogue, except that those of

ϵ Hydri, 38 G. Horologii, and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Institut zu Berlin*, 1907, No. 33.

The values of $\Delta\alpha$ and $\Delta\delta$, which are given for the companions to the stars γ Andromedæ, α^1 Crucis, ζ^1 Ursæ Majoris, and 61 Cygni, have been taken from BOSS's *Preliminary General Catalogue*, and those for α^2 Geminorum from DOBERCK's elements given in the *Astronomische Nachrichten*, 1904, vol. 166, page 145.

The formulæ for the computation of the Besselian and Independent Star Numbers are given on page 200, the coefficients being those given by NEWCOMB in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation, depending on the Moon's mean longitude, have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides are corrected for the effect of these short-period terms is given on page 201.

According to the formulæ on pages 200 and 201 the star constants a , b , c , d , a' , b' , c' , d' are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha - \alpha_0$	To $\delta - \delta_0$
$ \begin{aligned} &+0.000\ 003\ \tau^2 \sin \alpha \Big\} \tan \delta \\ &-0.000\ 149\ \tau^2 \cos \alpha \Big\} \\ &-0.000\ 0650\ \tau^2 \sin 2\alpha \\ &+0.000\ 0103\ \sin 2\ \odot \cos 2\alpha \Big\} \tan^2 \delta \\ &-0.000\ 0107\ \cos 2\ \odot \sin 2\alpha \Big\} \\ &+0.000\ 0620\ \sin 2\ \odot \cos 2\alpha \Big\} \sec^2 \delta \\ &-0.000\ 0622\ \cos 2\ \odot \sin 2\alpha \Big\} \\ &+0.000\ 0513\ \sin (\odot + \odot) \cos 2\alpha \Big\} \\ &-0.000\ 0507\ \cos (\odot + \odot) \sin 2\alpha \Big\} \tan \delta \sec \delta \\ &+0.000\ 0097\ \sin (\odot - \odot) \cos 2\alpha \Big\} \\ &-0.000\ 0053\ \cos (\odot - \odot) \sin 2\alpha \Big\} \end{aligned} $	$ \begin{aligned} &+0.000\ 975\ \tau^2 \sin^2 \alpha \\ &-0.000\ 023\ \cos 2\ \odot \\ &-0.000\ 080\ \cos 2\ \odot \cos 2\alpha \Big\} \tan \delta \\ &-0.000\ 077\ \sin 2\ \odot \sin 2\alpha \Big\} \\ &+0.000\ 040\ \cos 2\ \odot \\ &-0.000\ 467\ \cos 2\ \odot \cos 2\alpha \Big\} \\ &-0.000\ 465\ \sin 2\ \odot \sin 2\alpha \Big\} \\ &-0.000\ 039\ \cos (\odot + \odot) \\ &-0.000\ 380\ \cos (\odot + \odot) \cos 2\alpha \Big\} \sin \delta \tan \delta \\ &-0.000\ 385\ \sin (\odot + \odot) \sin 2\alpha \Big\} \\ &-0.000\ 380\ \cos (\odot - \odot) \\ &-0.000\ 040\ \cos (\odot - \odot) \cos 2\alpha \Big\} \\ &-0.000\ 072\ \sin (\odot - \odot) \sin 2\alpha \Big\} \end{aligned} $

These terms are negligible for stars whose declination is numerically less than 80° , but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of seven stars have been corrected for the effect of annual parallax. These stars, with the adopted values of the annual parallax, are—

τ Ceti	0.31	α Centauri	0.75
ϵ Eridani	0.32	α Aquilæ (Altair)	0.23
α Canis Majoris (Sirius) .	0.38	61 Cygni	0.30
α Canis Minoris (Procyon)	0.33		

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri have been corrected for the effect of orbital motion. AUWERS's

elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB's Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the *Star List of the American Ephemeris* [Supplement to the *American Ephemeris and Nautical Almanac*] for 1910 and 1911, and in the *American Ephemeris and Nautical Almanac* for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1923.0	1924.0	1923.0	1924.0	1923.0	1924.0
$\Delta\alpha$	-0 ^s .131	-0 ^s .126	-0 ^s .021	-0 ^s .009	+0 ^s .554	+0 ^s .535
$\Delta\delta$	-1 ^{''} .29	-1 ^{''} .38	+0 ^{''} .70	+0 ^{''} .74	+4 ^{''} .15	+3 ^{''} .82

These corrections have not been applied to the mean places as published in this volume.

The stars occulted by the Moon have been selected from the *Catalogue of Zodiacal Stars* contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with BESSEL's method, the special forms employed being a modification of those developed in CHAUVENET's *Spherical and Practical Astronomy*.

In the computation of the elements of eclipses, the following corrections to the longitude and latitude of the Moon have been applied. These corrections, corresponding to a correction of +7^{''}.0 in mean longitude and -0^{''}.5 in latitude, have been assumed in each case to be constant during the eclipse.

G. M. T.	$\delta\lambda$	$\delta\delta$
1923		
Mar. 2 ^d . 16 ^h	+7.9	+0.2
Mar. 17 1	+6.3	-1.1
Aug. 25 23	+6.8	-1.1
Sept. 10 9	+7.8	+0.2

The elongations of the satellites of Mars are derived from elements given by H. STRUVE in *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, 1911, page 1073.

The conjunctions and phenomena of Jupiter's four brighter satellites are derived from SAMPSON's tables. The configurations are derived from a continuation of DAMOISEAU's tables by M. POTTIER.

The elongations of the Vth satellite of Jupiter are derived from unpublished elements deduced from the observations of BARNARD.

The differential coordinates of Jupiter's VIth and VIIth satellites are derived from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The positions of the rings and the elongations and conjunctions of the satellites of Saturn are derived from elements given by H. STRUVE in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; with corrections communicated by H. STRUVE to the *Berliner Jahrbuch*. The differential coordinates of Phœbe are derived from elements and tables given in *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent outer dimensions (a and b) of the rings of Saturn are also according to STRUVE; the relative dimensions of the rings are computed from BESSEL's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of Ariel and Umbriel, the inner satellites of Uranus, are derived from the data of NEWCOMB's *Uranian and Neptunian Systems*, *Washington Observations*, 1873, Appendix I. The elongations of Titania and Oberon, the outer satellites of Uranus, are derived from elements given by H. STRUVE in *Abhandlungen der K. Preussischen Akademie der Wissenschaften*, 1912.

The elongations of the satellite of Neptune are derived from elements given by A. HALL in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is $16' 1''.50$, while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., $15' 59''.63$.

In the computation of the ephemeris for physical observations of the Sun the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	$7^{\circ} 15'$
Longitude of the ascending node of the Sun's equator on the ecliptic	$73^{\circ} 40' + 50''.25 (t-1850)$
Sidereal period of rotation (mean solar days)	$25^d 4.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π , by the formula,

$$S = 0.272\,469\,\pi + 1''.50$$

where the constant 0.272 469 is derived from the equatorial horizontal parallax given on page xvi and the semidiameter given on page xvii; and the constant $1''.50$ is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$\sin S = 0.272\,274 \sin \pi$$

In the computation of the ephemeris for physical observations of the Moon, the following notation and formulæ have been used, the value of I and the formulæ for physical libration being those given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907:

I —the inclination of the Moon's mean equator to the ecliptic ($=1^{\circ} 32'.1$),

Ω —the longitude of the ascending node of the Moon's orbit, or the longitude of the descending node of the Moon's mean equator,

C —the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east,

$\lambda, \beta, \alpha, \delta$ = the geocentric longitude, latitude, right ascension, and declination of the Moon,
 i = the inclination of the Moon's mean equator to the Earth's true equator,
 Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic,
 Ω' = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator,
 ζ = the Moon's mean longitude, referred to the mean equinox,
 g' = the Earth's mean anomaly,
 g = the Moon's mean anomaly,
 ω = the angular distance of the perigee of the Moon's orbit from its ascending node on the ecliptic,
 b, l = the optical librations in latitude and longitude, respectively,
 $\delta b, \delta l$ = the physical librations in latitude and longitude, respectively,
 $b + \delta b$ = the Moon's geocentric libration in latitude = the Earth's selenographic latitude,
 $l + \delta l$ = the Moon's geocentric libration in longitude = the Earth's selenographic longitude,
 δC = the physical libration of C ,
 $\mu = -0'.617 \sin 2 (\Omega - \lambda)$,
 $A = \sin I \cos (\Omega - \lambda)$,
 $\tan B = \tan I \sin (\Omega - \lambda)$,
 $\lambda' = \lambda + \mu + Ab$,
 $b = B - \beta$,
 $l = \lambda' - \zeta$,
 $\sin C' = \sin i \frac{\cos (\lambda' + \Delta - \Omega)}{\cos \delta} = -\sin i \frac{\cos (\alpha - \Omega')}{\cos b}$,
 $\delta b = +108'' \sin (\omega + l) + 37'' \sin (\omega - l) - 11'' \sin (g + \omega - l)$,
 $\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega$,
 $\quad - [108'' \cos (\omega + l) - 37'' \cos (\omega - l) + 11'' \cos (g + \omega - l)] \tan b$,
 $\delta C = - [108'' \cos (\omega + l) - 37'' \cos (\omega - l) + 11'' \cos (g + \omega - l)] \sec b$,
 $C = C' + \delta C$.

The Sun's selenographic latitude and longitude have been computed from formulae the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	$\left\{ \begin{array}{l} \alpha = 21^{\text{h}} 10^{\text{m}} 0^{\text{s}} + 1^{\text{s}}.565(t-1905) \\ \delta = 54^{\circ} 30' 0'' + 12''.60(t-1905) \end{array} \right.$
Position of north pole of Jupiter	$\left\{ \begin{array}{l} \alpha = 17^{\text{h}} 52^{\text{m}} 0^{\text{s}}.84 + 0^{\text{s}}.247(t-1910) \\ \delta = 64^{\circ} 33'.34''.6 - 0''.60(t-1910) \end{array} \right.$
Rotation period of Mars	$24^{\text{h}} 37^{\text{m}} 22^{\text{s}}.65$
Rotation period of Jupiter { System I.	$9^{\text{h}} 50^{\text{m}} 30^{\text{s}}.004$
{ System II.	$9^{\text{h}} 55^{\text{m}} 40^{\text{s}}.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	$52^{\circ}.01$
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	$47^{\circ}.31$
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	$96^{\circ}.58$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTIN (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395-403 and 517-524).

The adopted semidiameters of the planets, with the authority for each, are given on page xvii. Their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories the authority for the various positions is given in each case. The latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi' - \varphi$, and the distance from the center of the earth, ρ , are computed from the formulæ on page xvi, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

ANNIVERSARIES AND FESTIVALS, 1923.

New Year's Day	Monday, Jan. 1.
Epiphany	Saturday, Jan. 6.
Septuagesima Sunday	Sunday, Jan. 28.
Quinquagesima (Shrove Sunday)	Sunday, Feb. 11.
Lincoln's Birthday	Monday, Feb. 12.
Ash Wednesday	Wednesday, Feb. 14.
Washington's Birthday	Thursday, Feb. 22.
Palm Sunday	Sunday, Mar. 25.
Good Friday	Friday, Mar. 30.
First Day of Passover	Sunday, Apr. 1.
Easter Sunday	Sunday, Apr. 1.
Rogation Sunday	Sunday, May 6.
Ascension Day	Thursday, May 10.
Pentecost (Whit Sunday)	Sunday, May 20.
Hebrew Pentecost (Shebuoth)	Monday, May 21.
Trinity Sunday	Sunday, May 27.
Memorial Day	Wednesday, May 30.
Corpus Christi	Thursday, May 31.
Independence Day	Wednesday, July 4.
Labor Day	Monday, Sept. 3.
Hebrew New Year (Rosh Hashanah)	Tuesday, Sept. 11.
Day of Atonement (Yom Kippur)	Thursday, Sept. 20.
First Day of Feast of Tabernacles (Succoth)	Tuesday, Sept. 25.
Columbus Day	Friday, Oct. 12.
Election Day (in certain States)	Tuesday, Nov. 6.
Thanksgiving Day	Thursday, Nov. 29.
First Sunday in Advent	Sunday, Dec. 2.
Christmas Day	Tuesday, Dec. 25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 1923 of the Christian era comprises the latter part of the 147th and the beginning of the 148th year of the independence of the United States of America, and corresponds to the year 6636 of the Julian period.

Of the peoples using the Christian era some employ the Gregorian calendar and some the Julian. January 1, 1923, Julian calendar, corresponds to January 14, 1923, Gregorian calendar.

The year 7432 of the Byzantine era begins on September 1, 1923, Julian calendar.

The year 5684 of the Jewish era begins at sunset on September 10, 1923, Gregorian calendar.

The year 2676 since the foundation of Rome, according to VARRO, begins on January 1, 1923, Julian calendar.

The year 2672 of the era of NABONASSAR begins on April 30, 1923, Julian calendar.

The year 2583 of the Japanese era, being the 12th year of the period Taisho, begins on January 1, 1923, Gregorian calendar.

The year 2235 of the Grecian era, or the era of the SELEUCIDÆ, begins in the present-day usage of the Syrians on September 1, 1923, or on October 1, 1923, Julian calendar, according to different sects; but in the ancient usage of Damascus and Arabia Petræa the year began with the vernal equinox.

The year 1640 of the era of DIOCLETIAN begins on August 30, 1923, Julian calendar.

The year 1342 of the Mohammedan era, or the era of the Hegira, begins at sunset on August 13, 1923, Gregorian calendar.

2 423 421 is the Julian day number of January 1, 1923, Gregorian calendar.

CHRONOLOGICAL CYCLES.

Dominical Letter	G	Solar Cycle	28
Epact	13	Roman Indiction	6
Lunar Cycle or Golden Number	5	Julian Period	6636

ASTRONOMICAL CONSTANTS.

Solar Parallax	8.80	} Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	50''.2564+0''.000 222(<i>t</i> -1900)	} Newcomb.
Obliquity of the Ecliptic	23° 27' 8''.26-0''.4684(<i>t</i> -1900)	
Equatorial Horizontal Parallax of the Moon	57' 2''.70 (Brown).	
Mean distance Earth to Moon 384 403 kilometers=238 857 statute miles, or 60.2665 radii.		
Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.		
Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michelson).		
Light travels unit distance in 498°.580.		
Gaussian Gravitation Constant, * <i>k</i> =0.017 202 099=3 548''.187 61.		

Acceleration in one second due to gravity, $g=9.8060-0.0260 \cos 2\varphi - \frac{2h}{R} g \cdot \dagger$	} Helmert.
Length of seconds pendulum, $l=0.993\ 549-0.002\ 631 \cos 2\varphi - \frac{2h}{R} l \cdot \dagger$	

Length of the year:		
Tropical (ordinary)	^d 365.242 198 79-0.000 000 0614(<i>t</i> -1900)	} Newcomb.
Sidereal	^d 365.256 360 42+0.000 000 0011(<i>t</i> -1900)	
Anomalistic	^d 365.259 641 34+0.000 000 0304(<i>t</i> -1900)	
Eclipse	^d 346.620 031 +0.000 000 32 (<i>t</i> -1900)	

Length of the month:				
Synodical (ordinary)	^d 29.530 588=29 12 44 2.8	^h	^m	^s
Tropical	27.321 582=27 7 43 4.7			
Sidereal	27.321 661=27 7 43 11.5			
Anomalistic	27.554 550=27 13 18 33.1			
Nodical	27.212 220=27 5 5 35.8			

Length of the day:			
Sidereal	^h 23 ^m 56 ^s 4.091 of mean solar time.		
Mean Solar	24 3 56.555 of sidereal time.		

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\ 804$

Logarithm radius= $\log \rho=9.999\ 2695+0.000\ 7324 \cos 2\varphi-0.000\ 0019 \cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ' ,

$$\varphi' - \varphi = -11' 35''.66 \sin 2\varphi + 1''.17 \sin 4\varphi.$$

1 degree of latitude (in statute miles)=69.0569-0.3494 $\cos 2\varphi$ +0.0007 $\cos 4\varphi$.

1 degree of longitude (in statute miles)=69.2316 $\cos \varphi$ -0.0584 $\cos 3\varphi$ +0.0001 $\cos 5\varphi$.

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.

1 statute mile=0.868 362 nautical or geographical miles.

1 nautical mile=1.151 594 statute miles.

* *k*² is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

† φ =latitude, h =elevation above sea level in meters, and $\log R=6.80416$.

NOTE.—The above values of $\log \rho$ and $\varphi' - \varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $1 \div 297$.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance.†	In Kilometers.	In Statute Miles.	Authority.
Sun	15 59.63	....	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	....	1 737.99	1 079.93	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.41	30.40	6 095.71	3 787.69	Auwers.
Mars	4.68	8.94	3 392.14	2 107.78	Hartwig.
Jupiter (Equatorial) . . .	1 38.47	23.43	71 372.71	44 348.86	Sampson.
Jupiter (Polar)	1 31.91	21.87	66 617.91	41 394.37	Sampson.
Saturn (Equatorial) . . .	1 23.33	9.76	60 398.99	37 530.11	Struve.
Saturn (Polar)	1 14.57	8.73	54 049.59	33 584.79	Struve.
Uranus	34.28	1.88	24 846.72	15 439.00	Barnard, See, Wirtz.
Neptune	36.56	1.26	26 499.30	16 465.87	Barnard.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH JANUARY 0, 1923, G. M. N.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6189
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8097
⊕ Earth	1.000 000	1.000 04	3 548.193	. . . .	0.016 7414
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3341
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3752
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8104
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 1090
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5480

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.‡
☿ Mercury	7 0 11.9	47 25 6.7	76 15 26.8	354 8 45.92	3.221 8187-10
♀ Venus	3 23 37.9	75 59 11.8	130 29 15.4	120 59 3.05	4.389 3398-10
⊕ Earth . . . . .	. . . . .	. . . . .	101 36 58.4	99 8 3.52	4.482 2896-10
♂ Mars	1 51 0.6	48 57 49.4	334 38 29.6	15 56 43.51	3.509 5499-10
♃ Jupiter	1 18 26.8	99 40 13.5	13 4 55.4	216 20 13.28	6.979 9082-10
♄ Saturn	2 29 29.0	112 59 2.9	91 32 21.0	187 56 49.97	6.455 7335-10
♅ Uranus	0 46 22.0	73 36 21.4	169 25 0.9	342 13 52.65	5.640 7528-10
♆ Neptune	1 46 37.4	130 55 54.1	43 57 24.5	135° 35' 21.78	5.705 5338-10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, with the corrections for Mars given in Vol. IX, Part II, of the *Astronomical Papers* added, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1923 by applying LE VERRIER'S variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xi.

† By mean least distance is meant the difference between the mean distance and unity.

‡ Mass includes satellite system, if any. Mass of Earth without Moon has the logarithm 4.476 9900-10.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
♁	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.
- ☐ Quadrature, or differing $\pm 90^\circ$ in Longitude or Right Ascension.
- ♌ Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

♊	Ascending Node.	°	Degrees.
♋	Descending Node.	'	Minutes of Arc.
N.	North.	"	Seconds of Arc.
S.	South.	^h	Hours.
E.	East.	^m	Minutes of Time.
W.	West.	^s	Seconds of Time.

PART I.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Jan. 1	Mo	18 43 47.86	11.043	-23 3 53.3	+11.55	16 17.90	8.95	- 3 20.52	-1.187	18 40 27.34
2	Tu	18 48 12.75	11.030	22 59 2.3	12.70	16 17.91	8.95	3 48.85	1.173	18 44 23.90
3	We	18 52 37.30	11.016	22 53 43.8	13.84	16 17.91	8.95	4 16.84	1.159	18 48 20.46
4	Th	18 57 1.49	11.000	22 47 57.9	14.98	16 17.90	8.95	4 44.48	1.144	18 52 17.02
5	Fr	19 1 25.30	10.984	22 41 44.8	16.11	16 17.89	8.95	5 11.73	1.127	18 56 13.57
6	Sa	19 5 48.70	10.966	-22 35 4.7	+17.23	16 17.87	8.95	- 5 38.57	-1.110	19 0 10.13
7	Su	19 10 11.67	10.947	22 27 57.8	18.34	16 17.84	8.95	6 4.98	1.091	19 4 6.69
8	Mo	19 14 34.18	10.928	22 20 24.3	19.45	16 17.81	8.95	6 30.94	1.072	19 8 3.24
9	Tu	19 18 56.21	10.907	22 12 24.4	20.54	16 17.78	8.95	6 56.41	1.051	19 11 59.80
10	We	19 23 17.73	10.886	22 3 58.3	21.63	16 17.73	8.95	7 21.38	1.029	19 15 56.36
11	Th	19 27 38.72	10.863	-21 55 6.4	+22.70	16 17.68	8.95	- 7 45.81	-1.007	19 19 52.91
12	Fr	19 31 59.16	10.840	21 45 48.7	23.76	16 17.63	8.95	8 9.69	0.983	19 23 49.47
13	Sa	19 36 19.02	10.815	21 36 5.7	24.81	16 17.58	8.95	8 32.99	0.958	19 27 46.03
14	Su	19 40 38.27	10.789	21 25 57.7	25.85	16 17.52	8.95	8 55.68	0.933	19 31 42.58
15	Mo	19 44 56.89	10.762	21 15 24.8	26.88	16 17.45	8.95	9 17.75	0.906	19 35 39.14
16	Tu	19 49 14.85	10.735	-21 4 27.4	+27.90	16 17.39	8.95	- 9 39.16	-0.878	19 39 35.70
17	We	19 53 32.14	10.706	20 53 5.9	28.90	16 17.31	8.94	9 59.89	0.849	19 43 32.25
18	Th	19 57 48.73	10.676	20 41 20.5	29.89	16 17.24	8.94	10 19.92	0.820	19 47 28.81
19	Fr	20 2 4.60	10.646	20 29 11.5	30.86	16 17.16	8.94	10 39.23	0.790	19 51 25.36
20	Sa	20 6 19.73	10.615	20 16 39.4	31.81	16 17.08	8.94	10 57.81	0.759	19 55 21.92
21	Su	20 10 34.11	10.583	-20 3 44.5	+32.76	16 17.00	8.94	-11 15.63	-0.727	19 59 18.48
22	Mo	20 14 47.71	10.551	19 50 27.0	33.69	16 16.91	8.94	11 32.68	0.694	20 3 15.03
23	Tu	20 19 0.54	10.518	19 36 47.5	34.60	16 16.81	8.94	11 48.95	0.661	20 7 11.59
24	We	20 23 12.57	10.485	19 22 46.2	35.50	16 16.71	8.94	12 4.43	0.628	20 11 8.14
25	Th	20 27 23.80	10.451	19 8 23.5	36.39	16 16.61	8.94	12 19.10	0.594	20 15 4.70
26	Fr	20 31 34.21	10.417	-18 53 39.8	+37.26	16 16.50	8.94	-12 32.95	-0.560	20 19 1.26
27	Sa	20 35 43.80	10.383	18 38 35.4	38.11	16 16.39	8.94	12 45.99	0.526	20 22 57.81
28	Su	20 39 52.57	10.348	18 23 10.8	38.94	16 16.27	8.94	12 58.20	0.492	20 26 54.37
29	Mo	20 44 0.51	10.314	18 7 26.3	39.76	16 16.15	8.93	13 9.59	0.457	20 30 50.92
30	Tu	20 48 7.62	10.279	17 51 22.4	40.57	16 16.02	8.93	13 20.15	0.423	20 34 47.48
31	We	20 52 13.91	10.245	-17 34 59.3	+41.35	16 15.89	8.93	-13 29.88	-0.388	20 38 44.03
Feb. 1	Th	20 56 19.37	10.210	17 18 17.6	42.12	16 15.75	8.93	13 38.78	0.354	20 42 40.59
2	Fr	21 0 24.00	10.176	17 1 17.5	42.88	16 15.60	8.93	13 46.86	0.320	20 46 37.14
3	Sa	21 4 27.82	10.142	16 43 59.5	43.62	16 15.45	8.93	13 54.13	0.286	20 50 33.70
4	Su	21 8 30.84	10.109	16 26 23.9	44.34	16 15.29	8.93	14 0.59	0.252	20 54 30.25
5	Mo	21 12 33.05	10.075	-16 8 31.2	+45.05	16 15.12	8.92	-14 6.24	-0.219	20 58 26.80
6	Tu	21 16 34.46	10.042	15 50 21.7	45.74	16 14.96	8.92	14 11.10	0.186	21 2 23.36
7	We	21 20 35.08	10.010	15 31 55.9	46.41	16 14.78	8.92	14 15.17	0.153	21 6 19.91
8	Th	21 24 34.93	9.977	15 13 14.2	47.06	16 14.61	8.92	14 18.46	0.121	21 10 16.47
9	Fr	21 28 33.99	9.945	14 54 16.9	47.70	16 14.43	8.92	14 20.97	0.089	21 14 13.02
10	Sa	21 32 32.28	9.913	-14 35 4.6	+48.32	16 14.24	8.92	-14 22.71	-0.057	21 18 9.58
11	Su	21 36 29.81	9.881	14 15 37.6	48.93	16 14.06	8.92	14 23.69	-0.025	21 22 6.13
12	Mo	21 40 26.58	9.850	13 55 56.3	49.51	16 13.87	8.91	14 23.90	+0.007	21 26 2.68
13	Tu	21 44 22.60	9.819	13 36 1.2	50.08	16 13.68	8.91	14 23.36	0.038	21 29 59.24
14	We	21 48 17.87	9.787	13 15 52.7	50.63	16 13.48	8.91	14 22.07	0.069	21 33 55.79
15	Th	21 52 12.39	9.756	-12 55 31.3	+51.16	16 13.28	8.91	-14 20.05	+0.100	21 37 52.34
16	Fr	21 56 6.18	9.726	-12 34 57.3	+51.67	16 13.08	8.91	-14 17.29	+0.130	21 41 48.90

FOR GREENWICH MEAN NOON.

Data.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Oblig-uity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
Jan. 1	1	280 4 13.5	152.85	-0.29	9.992 6562	-1.7	0.02	-1.30	20.81	47.70	5 18 40.31
	2	281 5 21.8	152.85	0.28	9.992 6534	-0.6	0.15	1.27	20.81	47.71	5 14 44.40
	3	282 6 30.1	152.85	0.24	9.992 6535	+0.6	0.29	1.24	20.81	47.71	5 10 48.48
	4	283 7 38.4	152.85	0.17	9.992 6565	1.8	0.43	1.21	20.81	47.72	5 6 52.57
	5	284 8 46.8	152.85	-0.08	9.992 6623	3.0	0.57	1.19	20.81	47.73	5 2 56.66
	6	285 9 55.2	152.85	+0.04	9.992 6710	+4.2	0.70	-1.16	20.81	47.74	4 59 0.75
	7	286 11 3.7	152.86	0.17	9.992 6824	5.3	0.84	1.13	20.81	47.75	4 55 4.84
	8	287 12 12.3	152.86	0.31	9.992 6964	6.3	0.98	1.11	20.81	47.76	4 51 8.93
	9	288 13 21.0	152.86	0.44	9.992 7128	7.3	1.12	1.09	20.81	47.77	4 47 13.02
	10	289 14 29.7	152.86	0.56	9.992 7316	8.3	1.25	1.06	20.81	47.78	4 43 17.11
	11	290 15 38.5	152.86	+0.67	9.992 7526	+9.2	1.39	-1.04	20.81	47.79	4 39 21.20
	12	291 16 47.2	152.86	0.76	9.992 7756	10.0	1.53	1.02	20.81	47.81	4 35 25.28
	13	292 17 55.9	152.86	0.81	9.992 8005	10.7	1.67	1.00	20.81	47.82	4 31 29.37
	14	293 19 4.4	152.85	0.83	9.992 8271	11.4	1.80	0.98	20.81	47.84	4 27 33.46
	15	294 20 12.6	152.83	0.81	9.992 8554	12.1	1.94	0.97	20.80	47.85	4 23 37.55
	16	295 21 20.4	152.81	+0.77	9.992 8854	+12.8	2.08	-0.95	20.80	47.86	4 19 41.64
	17	296 22 27.8	152.79	0.70	9.992 9169	13.5	2.22	0.94	20.80	47.88	4 15 45.73
	18	297 23 34.5	152.77	0.61	9.992 9500	14.1	2.36	0.92	20.80	47.90	4 11 49.82
	19	298 24 40.6	152.74	0.50	9.992 9847	14.8	2.49	0.91	20.80	47.91	4 7 53.91
	20	299 25 46.0	152.71	0.38	9.993 0211	15.5	2.63	0.90	20.80	47.93	4 3 58.00
	21	300 26 50.5	152.67	+0.25	9.993 0592	+16.2	2.77	-0.89	20.79	47.95	4 0 2.09
	22	301 27 54.1	152.63	0.13	9.993 0990	17.0	2.91	0.88	20.79	47.96	3 56 6.18
	23	302 28 56.8	152.59	+0.01	9.993 1408	17.8	3.04	0.88	20.79	47.98	3 52 10.27
	24	303 29 58.4	152.55	-0.10	9.993 1844	18.6	3.18	0.87	20.79	48.00	3 48 14.36
	25	304 30 59.0	152.50	0.19	9.993 2301	19.5	3.32	0.87	20.79	48.02	3 44 18.45
	26	305 31 58.5	152.46	-0.27	9.993 2779	+20.4	3.46	-0.87	20.78	48.04	3 40 22.54
	27	306 32 56.9	152.41	0.32	9.993 3279	21.3	3.59	0.87	20.78	48.06	3 36 26.63
	28	307 33 54.1	152.36	0.34	9.993 3801	22.3	3.73	0.87	20.78	48.07	3 32 30.72
	29	308 34 50.1	152.31	0.33	9.993 4347	23.3	3.87	0.87	20.78	48.09	3 28 34.82
	30	309 35 44.9	152.26	0.29	9.993 4918	24.3	4.01	0.88	20.77	48.11	3 24 38.91
	31	310 36 38.6	152.21	-0.23	9.993 5514	+25.4	4.14	-0.88	20.77	48.13	3 20 43.00
Feb. 1	32	311 37 31.2	152.17	0.14	9.993 6136	26.5	4.28	0.89	20.77	48.15	3 16 47.09
	2	312 38 22.8	152.12	-0.03	9.993 6784	27.5	4.42	0.90	20.76	48.17	3 12 51.18
	3	313 39 13.2	152.08	+0.10	9.993 7457	28.6	4.56	0.91	20.76	48.19	3 8 55.27
	4	314 40 2.7	152.04	0.24	9.993 8156	29.6	4.69	0.93	20.76	48.21	3 4 59.36
	5	315 40 51.2	152.00	+0.38	9.993 8879	+30.6	4.83	-0.94	20.75	48.23	3 1 3.45
	6	316 41 38.8	151.96	0.50	9.993 9624	31.5	4.97	0.96	20.75	48.25	2 57 7.54
	7	317 42 25.4	151.92	0.61	9.994 0390	32.3	5.11	0.97	20.75	48.27	2 53 11.64
	8	318 43 11.1	151.88	0.71	9.994 1175	33.1	5.25	0.99	20.74	48.29	2 49 15.73
	9	319 43 55.9	151.84	0.77	9.994 1978	33.8	5.38	1.02	20.74	48.31	2 45 19.82
	10	320 44 39.6	151.80	+0.79	9.994 2797	+34.4	5.52	-1.04	20.74	48.33	2 41 23.91
	11	321 45 22.2	151.75	0.78	9.994 3631	35.0	5.66	1.06	20.73	48.35	2 37 28.00
	12	322 46 3.7	151.70	0.75	9.994 4477	35.5	5.80	1.09	20.73	48.37	2 33 32.10
	13	323 46 44.0	151.66	0.69	9.994 5335	36.0	5.93	1.12	20.72	48.39	2 29 36.19
	14	324 47 23.0	151.60	0.61	9.994 6204	36.4	6.07	1.14	20.72	48.41	2 25 40.28
	15	325 48 0.6	151.54	+0.50	9.994 7084	+36.9	6.21	-1.17	20.72	48.43	2 21 44.37
	16	326 48 36.7	151.47	+0.37	9.994 7974	+37.3	6.35	-1.21	20.71	48.45	2 17 48.47

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Feb. 16	Fr	21 56 6.18	9.726	-12 34 57.3	+51.67	16 13.08	8.91	-14 17.29	+0.130	21 41 48.90
17	Sa	21 59 59.25	9.696	12 14 11.2	52.17	16 12.88	8.90	14 13.80	0.160	21 45 45.45
18	Su	22 3 51.60	9.666	11 53 13.4	52.61	16 12.68	8.90	14 9.60	0.190	21 49 42.00
19	Mo	22 7 43.24	9.637	11 32 4.4	53.10	16 12.47	8.90	14 4.69	0.219	21 53 38.56
20	Tu	22 11 34.19	9.609	11 10 44.6	53.55	16 12.26	8.90	13 59.08	0.248	21 57 35.11
21	We	22 15 24.46	9.581	-10 49 14.3	+53.97	16 12.05	8.90	-13 52.80	+0.276	22 1 31.66
22	Th	22 19 14.06	9.553	10 27 34.1	54.38	16 11.84	8.89	13 45.84	0.301	22 5 28.22
23	Fr	22 23 3.00	9.526	10 5 44.3	54.77	16 11.62	8.89	13 38.23	0.331	22 9 24.77
24	Sa	22 26 51.30	9.499	9 43 45.3	55.14	16 11.41	8.89	13 29.97	0.357	22 13 21.32
25	Su	22 30 38.97	9.473	9 21 37.5	55.50	16 11.18	8.89	13 21.09	0.383	22 17 17.87
26	Mo	22 34 26.03	9.448	- 8 59 21.5	+55.84	16 10.96	8.89	-13 11.60	+0.408	22 21 14.43
27	Tu	22 38 12.50	9.424	8 36 57.4	56.16	16 10.73	8.88	13 1.52	0.432	22 25 10.98
28	We	22 41 58.40	9.401	8 14 25.8	56.47	16 10.50	8.88	12 50.87	0.456	22 29 7.53
Mar. 1	Th	22 45 43.75	9.378	7 51 47.1	56.76	16 10.26	8.88	12 39.66	0.478	22 33 4.08
2	Fr	22 49 28.56	9.356	7 29 1.6	57.03	16 10.02	8.88	12 27.93	0.499	22 37 0.64
3	Sa	22 53 12.87	9.336	- 7 6 9.6	+57.29	16 9.78	8.88	-12 15.69	+0.520	22 40 57.19
4	Su	22 56 56.70	9.317	6 43 11.6	57.54	16 9.53	8.87	12 2.96	0.540	22 44 53.74
5	Mo	23 0 40.07	9.298	6 20 8.0	57.77	16 9.28	8.87	11 49.77	0.559	22 48 50.29
6	Tu	23 4 23.00	9.280	5 56 59.0	57.98	16 9.03	8.87	11 36.15	0.576	22 52 46.84
7	We	23 8 5.51	9.263	5 33 45.1	58.18	16 8.77	8.87	11 22.12	0.593	22 56 43.40
8	Th	23 11 47.64	9.248	- 5 10 26.7	+58.36	16 8.51	8.86	-11 7.69	+0.609	23 0 39.95
9	Fr	23 15 29.40	9.232	4 47 4.1	58.53	16 8.25	8.86	10 52.90	0.624	23 4 36.50
10	Sa	23 19 10.80	9.218	4 23 37.6	58.68	16 7.98	8.86	10 37.75	0.638	23 8 33.05
11	Su	23 22 51.88	9.205	4 0 7.8	58.81	16 7.72	8.86	10 22.27	0.652	23 12 29.60
12	Mo	23 26 32.64	9.192	3 36 34.9	58.93	16 7.45	8.85	10 6.48	0.664	23 16 26.16
13	Tu	23 30 13.10	9.180	- 3 12 59.4	+59.03	16 7.18	8.85	- 9 50.39	+0.676	23 20 22.71
14	We	23 33 53.29	9.169	2 49 21.7	59.11	16 6.92	8.85	9 34.03	0.687	23 24 19.26
15	Th	23 37 33.22	9.158	2 25 42.1	59.18	16 6.65	8.85	9 17.41	0.698	23 28 15.81
16	Fr	23 41 12.90	9.149	2 2 1.0	59.24	16 6.38	8.84	9 0.54	0.708	23 32 12.36
17	Sa	23 44 52.36	9.140	1 38 18.8	59.28	16 6.11	8.84	8 43.45	0.717	23 36 8.92
18	Su	23 48 31.61	9.131	- 1 14 35.9	+59.30	16 5.84	8.84	- 8 26.15	+0.725	23 40 5.47
19	Mo	23 52 10.67	9.124	0 50 52.7	59.30	16 5.57	8.84	8 8.65	0.733	23 44 2.02
20	Tu	23 55 49.56	9.117	0 27 9.5	59.29	16 5.30	8.83	7 50.99	0.740	23 47 58.57
21	We	23 59 28.29	9.111	- 0 3 26.7	59.27	16 5.03	8.83	7 33.16	0.746	23 51 55.12
22	Th	0 3 6.88	9.105	+ 0 20 15.2	59.23	16 4.76	8.83	7 15.20	0.751	23 55 51.67
23	Fr	0 6 45.35	9.101	+ 0 43 56.0	+59.17	16 4.49	8.83	- 6 57.12	+0.756	23 59 48.22
24	Sa	0 10 23.72	9.097	1 7 35.3	59.10	16 4.22	8.82	6 38.94	0.759	0 3 44.78
25	Su	0 14 2.00	9.094	1 31 12.6	59.01	16 3.96	8.82	6 20.68	0.762	0 7 41.33
26	Mo	0 17 40.23	9.092	1 54 47.6	58.91	16 3.69	8.82	6 2.35	0.765	0 11 37.88
27	Tu	0 21 18.41	9.090	2 18 20.0	58.79	16 3.42	8.82	5 43.98	0.766	0 15 34.43
28	We	0 24 56.56	9.090	+ 2 41 49.5	+58.66	16 3.14	8.82	- 5 25.58	+0.767	0 19 30.98
29	Th	0 28 34.72	9.090	3 5 15.6	58.51	16 2.87	8.81	5 7.18	0.766	0 23 27.53
30	Fr	0 32 12.89	9.091	3 28 38.0	58.35	16 2.60	8.81	4 48.80	0.765	0 27 24.09
31	Sa	0 35 51.11	9.094	3 51 56.4	58.18	16 2.32	8.81	4 30.47	0.762	0 31 20.64
Apr. 1	Su	0 39 29.40	9.097	4 15 10.5	57.99	16 2.05	8.81	4 12.21	0.759	0 35 17.19
2	Mo	0 43 7.78	9.101	+ 4 38 19.9	+57.79	16 1.77	8.80	- 3 54.04	+0.755	0 39 13.74
3	Tu	0 46 46.28	9.107	+ 5 1 24.3	+57.58	16 1.49	8.80	- 3 35.99	+0.749	0 43 10.29

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
Feb. 16	47	326 48 36.7	151.47	+0.37	9.994 7974	+37.3	6.35	-1.21	20.71	48.45	2 17 48.47
17	48	327 49 11.3	151.41	0.24	9.994 8874	37.7	6.48	1.24	20.71	48.46	2 13 52.56
18	49	328 49 44.3	151.34	+0.11	9.994 9784	38.1	6.62	1.28	20.70	48.48	2 9 56.65
19	50	329 50 15.5	151.27	-0.02	9.995 0704	38.6	6.76	1.31	20.70	48.50	2 6 0.74
20	51	330 50 45.1	151.19	0.13	9.995 1635	39.0	6.90	1.35	20.69	48.52	2 2 4.84
21	52	331 51 12.8	151.12	-0.23	9.995 2577	+39.5	7.03	-1.39	20.69	48.53	1 58 8.93
22	53	332 51 38.7	151.04	0.31	9.995 3530	40.0	7.17	1.43	20.69	48.55	1 54 13.02
23	54	333 52 2.7	150.96	0.37	9.995 4495	40.5	7.31	1.47	20.68	48.56	1 50 17.12
24	55	334 52 24.7	150.88	0.40	9.995 5473	41.0	7.45	1.52	20.68	48.58	1 46 21.21
25	56	335 52 44.8	150.80	0.40	9.995 6465	41.6	7.58	1.56	20.67	48.60	1 42 25.30
26	57	336 53 2.9	150.71	-0.37	9.995 7471	+42.2	7.72	-1.61	20.67	48.61	1 38 29.39
27	58	337 53 19.0	150.63	0.31	9.995 8492	42.9	7.86	1.65	20.66	48.62	1 34 33.49
28	59	338 53 33.1	150.55	0.23	9.995 9530	43.6	8.00	1.70	20.66	48.64	1 30 37.58
Mar. 1	60	339 53 45.2	150.47	-0.12	9.996 0584	44.3	8.14	1.75	20.65	48.65	1 26 41.67
2	61	340 53 55.5	150.39	+0.01	9.996 1656	45.0	8.27	1.80	20.65	48.66	1 22 45.77
3	62	341 54 3.9	150.31	+0.14	9.996 2746	+45.8	8.41	-1.85	20.64	48.68	1 18 49.86
4	63	342 54 10.5	150.24	0.28	9.996 3854	46.5	8.55	1.90	20.64	48.69	1 14 53.96
5	64	343 54 15.4	150.17	0.42	9.996 4978	47.2	8.69	1.96	20.63	48.70	1 10 58.05
6	65	344 54 18.6	150.10	0.54	9.996 6118	47.8	8.82	2.01	20.62	48.71	1 7 2.14
7	66	345 54 20.2	150.03	0.63	9.996 7272	48.4	8.96	2.06	20.62	48.72	1 3 6.24
8	67	346 54 20.2	149.97	+0.70	9.996 8439	+48.8	9.10	-2.12	20.61	48.73	0 59 10.33
9	68	347 54 18.6	149.90	0.74	9.996 9616	49.3	9.24	2.18	20.61	48.74	0 55 14.42
10	69	348 54 15.4	149.83	0.75	9.997 0803	49.6	9.37	2.23	20.60	48.74	0 51 18.52
11	70	349 54 10.5	149.76	0.72	9.997 1996	49.8	9.51	2.29	20.60	48.75	0 47 22.61
12	71	350 54 4.0	149.69	0.66	9.997 3195	50.0	9.65	2.35	20.59	48.76	0 43 26.71
13	72	351 53 55.8	149.62	+0.58	9.997 4398	+50.2	9.79	-2.40	20.59	48.76	0 39 30.80
14	73	352 53 45.8	149.55	0.47	9.997 5604	50.3	9.92	2.46	20.58	48.77	0 35 34.90
15	74	353 53 34.0	149.47	0.35	9.997 6813	50.4	10.06	2.52	20.57	48.77	0 31 38.99
16	75	354 53 20.4	149.39	0.23	9.997 8022	50.4	10.20	2.58	20.57	48.78	0 27 43.08
17	76	355 53 4.8	149.31	+0.10	9.997 9232	50.4	10.34	2.64	20.56	48.78	0 23 47.18
18	77	356 52 47.2	149.22	-0.03	9.998 0442	+50.4	10.47	-2.70	20.56	48.78	0 19 51.27
19	78	357 52 27.5	149.14	0.16	9.998 1653	50.4	10.61	2.76	20.55	48.79	0 15 55.37
20	79	358 52 5.8	149.05	0.27	9.998 2863	50.4	10.75	2.82	20.55	48.79	0 11 59.46
21	80	359 51 41.9	148.96	0.36	9.998 4073	50.4	10.89	2.88	20.54	48.79	0 8 3.56
22	81	0 51 15.8	148.86	0.43	9.998 5283	50.4	11.02	2.94	20.53	48.79	0 4 7.65
23	82	1 50 47.4	148.77	-0.47	9.998 6494	+50.5	11.16	-3.00	20.53	48.79	{ 0 0 11.74 23 56 15.84
24	83	2 50 16.8	148.68	0.47	9.998 7706	50.5	11.30	3.06	20.52	48.79	23 52 19.93
25	84	3 49 43.9	148.58	0.45	9.998 8919	50.6	11.44	3.12	20.52	48.78	23 48 24.03
26	85	4 49 8.6	148.48	0.41	9.999 0134	50.7	11.58	3.18	20.51	48.78	23 44 28.12
27	86	5 48 31.1	148.39	0.34	9.999 1352	50.9	11.71	3.24	20.51	48.78	23 40 32.21
28	87	6 47 51.2	148.29	-0.24	9.999 2575	+51.1	11.85	-3.30	20.50	48.77	23 36 36.31
29	88	7 47 8.9	148.19	-0.12	9.999 3803	51.3	11.99	3.36	20.49	48.77	23 32 40.40
30	89	8 46 24.4	148.10	+0.02	9.999 5037	51.6	12.13	3.42	20.49	48.76	23 28 44.50
31	90	9 45 37.8	148.01	0.15	9.999 6278	51.9	12.26	3.48	20.48	48.76	23 24 48.59
Apr. 1	91	10 44 49.0	147.92	0.28	9.999 7526	52.1	12.40	3.53	20.48	48.75	23 20 52.68
2	92	11 43 58.1	147.84	+0.41	9.999 8781	+52.4	12.54	-3.59	20.47	48.74	23 16 56.78
3	93	12 43 5.3	147.76	+0.52	0.000 0043	+52.7	12.68	-3.65	20.46	48.74	23 13 0.87

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.						
		h	m	s	s	°	'	"	"	'	"	m	s	h	m	s				
Apr.	1	Su	0	39	29.40	9.097	+	4	15	10.5	+57.99	16	2.05	8.81	—4	12.21	+0.759	0	35	17.19
	2	Mo	0	43	7.78	9.101		4	38	19.9	57.79	16	1.77	8.80	3	54.04	0.755	0	39	13.74
	3	Tu	0	46	46.28	9.107		5	1	24.3	57.58	16	1.49	8.80	3	35.99	0.749	0	43	10.29
	4	We	0	50	24.93	9.113		5	24	23.5	57.35	16	1.21	8.80	3	18.08	0.743	0	47	6.85
	5	Th	0	54	3.73	9.121		5	47	17.0	57.11	16	0.93	8.79	3	0.34	0.736	0	51	3.40
	6	Fr	0	57	42.73	9.129	+	6	10	4.5	+56.85	16	0.65	8.79	—2	42.78	+0.727	0	54	59.95
	7	Sa	1	1	21.93	9.138		6	32	45.8	56.58	16	0.37	8.79	2	25.43	0.718	0	58	56.50
	8	Su	1	5	1.35	9.148		6	55	20.4	56.30	16	0.08	8.79	2	8.30	0.709	1	2	53.06
	9	Mo	1	8	41.02	9.158		7	17	48.0	56.00	15	59.80	8.78	1	51.41	0.698	1	6	49.61
	10	Tu	1	12	20.95	9.169		7	40	8.3	55.69	15	59.53	8.78	1	34.79	0.687	1	10	46.16
	11	We	1	16	1.15	9.181	+	8	2	21.0	+55.36	15	59.25	8.78	—1	18.43	+0.676	1	14	42.71
	12	Th	1	19	41.64	9.193		8	24	25.6	55.02	15	58.97	8.78	1	2.37	0.663	1	18	39.26
	13	Fr	1	23	22.43	9.206		8	46	21.8	54.67	15	58.70	8.77	0	46.61	0.650	1	22	35.82
	14	Sa	1	27	3.54	9.220		9	8	9.4	54.30	15	58.43	8.77	0	31.17	0.637	1	26	32.37
	15	Su	1	30	44.98	9.234		9	29	47.9	53.91	15	58.16	8.77	0	16.06	0.623	1	30	28.92
	16	Mo	1	34	26.76	9.248	+	9	51	16.9	+53.51	15	57.89	8.77	—0	1.29	+0.608	1	34	25.47
	17	Tu	1	38	8.90	9.263		10	12	36.2	53.10	15	57.62	8.76	+0	13.12	0.593	1	38	22.03
	18	We	1	41	51.41	9.279		10	33	45.4	52.67	15	57.36	8.76	0	27.17	0.578	1	42	18.58
	19	Th	1	45	34.30	9.295		10	54	44.1	52.22	15	57.10	8.76	0	40.84	0.561	1	46	15.13
	20	Fr	1	49	17.57	9.311		11	15	32.0	51.76	15	56.84	8.76	0	54.11	0.545	1	50	11.69
	21	Sa	1	53	1.25	9.329	+	11	36	8.8	+51.29	15	56.58	8.76	+1	6.99	+0.528	1	54	8.24
	22	Su	1	56	45.34	9.346		11	56	34.0	50.81	15	56.33	8.75	1	19.45	0.511	1	58	4.79
	23	Mo	2	0	29.85	9.363		12	16	47.4	50.31	15	56.08	8.75	1	31.50	0.493	2	2	1.34
	24	Tu	2	4	14.79	9.382		12	36	48.7	49.79	15	55.83	8.75	1	43.11	0.474	2	5	57.90
	25	We	2	8	0.18	9.401		12	56	37.4	49.27	15	55.58	8.75	1	54.27	0.456	2	9	54.45
	26	Th	2	11	46.03	9.420	+	13	16	13.4	+48.73	15	55.34	8.74	+2	4.98	+0.437	2	13	51.00
	27	Fr	2	15	32.34	9.439		13	35	36.1	48.17	15	55.09	8.74	2	15.22	0.417	2	17	47.56
	28	Sa	2	19	19.13	9.460		13	54	45.4	47.60	15	54.85	8.74	2	24.98	0.397	2	21	44.11
	29	Su	2	23	6.41	9.481		14	13	40.9	47.02	15	54.61	8.74	2	34.25	0.376	2	25	40.66
	30	Mo	2	26	54.21	9.502		14	32	22.3	46.43	15	54.36	8.74	2	43.01	0.354	2	29	37.22
May	1	Tu	2	30	42.52	9.524	+	14	50	49.4	+45.82	15	54.12	8.73	+2	51.25	+0.332	2	33	33.77
	2	We	2	34	31.38	9.547		15	9	1.7	45.20	15	53.88	8.73	2	58.95	0.309	2	37	30.33
	3	Th	2	38	20.78	9.570		15	26	59.1	44.57	15	53.64	8.73	3	6.10	0.286	2	41	26.88
	4	Fr	2	42	10.73	9.593		15	44	41.2	43.93	15	53.41	8.73	3	12.70	0.263	2	45	23.44
	5	Sa	2	46	1.26	9.617		16	2	7.7	43.28	15	53.17	8.72	3	18.73	0.239	2	49	19.99
	6	Su	2	49	52.36	9.641	+	16	19	18.4	+42.61	15	52.94	8.72	+3	24.19	+0.215	2	53	16.54
	7	Mo	2	53	44.04	9.666		16	36	12.9	41.93	15	52.70	8.72	3	29.06	0.191	2	57	13.10
	8	Tu	2	57	36.31	9.690		16	52	50.9	41.24	15	52.48	8.72	3	33.35	0.166	3	1	9.65
	9	We	3	1	29.16	9.714		17	9	12.1	40.53	15	52.25	8.72	3	37.05	0.142	3	5	6.21
	10	Th	3	5	22.60	9.739		17	25	16.2	39.81	15	52.02	8.71	3	40.16	0.118	3	9	2.76
	11	Fr	3	9	16.63	9.763	+	17	41	2.9	+39.08	15	51.80	8.71	+3	42.69	+0.093	3	12	59.32
	12	Sa	3	13	11.24	9.788		17	56	31.9	38.34	15	51.59	8.71	3	44.63	0.069	3	16	55.87
	13	Su	3	17	6.44	9.812		18	11	42.9	37.58	15	51.38	8.71	3	45.98	0.044	3	20	52.43
	14	Mo	3	21	2.23	9.836		18	26	35.6	36.81	15	51.17	8.71	3	46.75	+0.020	3	24	48.98
	15	Tu	3	24	58.59	9.860		18	41	9.8	36.03	15	50.96	8.70	3	46.95	—0.004	3	28	45.54
	16	We	3	28	55.52	9.884	+	18	55	25.0	+35.24	15	50.76	8.70	+3	46.57	—0.028	3	32	42.09
	17	Th	3	32	53.01	9.907	+	19	9	21.1	+34.44	15	50.57	8.70	+3	45.63	—0.051	3	36	38.64

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aberation.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
Apr. 1	91	10 44 49.0	147.92	+0.28	9.999 7526	+52.1	12.40	-3.53	20.48	48.75	23 20 52.68
2	92	11 43 58.1	147.84	0.41	9.999 8781	52.4	12.54	3.59	20.47	48.74	23 16 56.78
3	93	12 43 5.3	147.76	0.52	0.000 0043	52.7	12.68	3.65	20.46	48.74	23 13 0.87
4	94	13 42 10.6	147.68	0.60	0.000 1309	52.9	12.81	3.70	20.46	48.73	23 9 4.97
5	95	14 41 14.0	147.61	0.64	0.000 2580	53.0	12.95	3.76	20.45	48.72	23 5 9.06
6	96	15 40 15.7	147.54	+0.66	0.000 3853	+53.1	13.09	-3.81	20.45	48.71	23 1 13.15
7	97	16 39 15.7	147.46	0.65	0.000 5126	53.0	13.23	3.87	20.44	48.70	22 57 17.25
8	98	17 38 13.9	147.39	0.60	0.000 6398	52.9	13.36	3.92	20.43	48.69	22 53 21.34
9	99	18 37 10.4	147.32	0.52	0.000 7667	52.8	13.50	3.97	20.43	48.68	22 49 25.43
10	100	19 36 5.2	147.25	0.42	0.000 8932	52.6	13.64	4.02	20.42	48.67	22 45 29.53
11	101	20 34 58.2	147.17	+0.30	0.001 0191	+52.3	13.78	-4.07	20.42	48.66	22 41 33.62
12	102	21 33 49.3	147.09	0.17	0.001 1442	52.0	13.91	4.12	20.41	48.64	22 37 37.71
13	103	22 32 38.7	147.02	+0.04	0.001 2686	51.6	14.05	4.17	20.40	48.63	22 33 41.81
14	104	23 31 26.2	146.94	-0.09	0.001 3920	51.2	14.19	4.21	20.40	48.62	22 29 45.90
15	105	24 30 11.8	146.86	0.22	0.001 5145	50.8	14.33	4.26	20.39	48.60	22 25 50.00
16	106	25 28 55.5	146.78	-0.33	0.001 6359	+50.4	14.47	-4.30	20.39	48.59	22 21 54.09
17	107	26 27 37.2	146.70	0.42	0.001 7563	49.9	14.60	4.35	20.38	48.57	22 17 58.18
18	108	27 26 16.9	146.61	0.49	0.001 8756	49.5	14.74	4.39	20.38	48.56	22 14 2.27
19	109	28 24 54.5	146.53	0.54	0.001 9938	49.0	14.88	4.43	20.37	48.54	22 10 6.37
20	110	29 23 30.1	146.44	0.56	0.002 1109	48.6	15.02	4.47	20.37	48.53	22 6 10.46
21	111	30 22 3.6	146.35	-0.55	0.002 2269	+48.1	15.15	-4.51	20.36	48.51	22 2 14.55
22	112	31 20 34.9	146.26	0.51	0.002 3419	47.7	15.29	4.55	20.35	48.50	21 58 18.65
23	113	32 19 4.1	146.17	0.45	0.002 4560	47.4	15.43	4.58	20.35	48.48	21 54 22.74
24	114	33 17 31.1	146.08	0.36	0.002 5692	47.0	15.57	4.62	20.34	48.46	21 50 26.83
25	115	34 15 55.9	145.99	0.25	0.002 6816	46.7	15.70	4.65	20.34	48.45	21 46 30.92
26	116	35 14 18.6	145.90	-0.12	0.002 7933	+46.4	15.84	-4.68	20.33	48.43	21 42 35.02
27	117	36 12 39.1	145.81	+0.02	0.002 9045	46.2	15.98	4.71	20.33	48.41	21 38 39.11
28	118	37 10 57.6	145.73	0.16	0.003 0153	46.1	16.12	4.74	20.32	48.39	21 34 43.20
29	119	38 9 14.1	145.65	0.28	0.003 1257	45.9	16.25	4.77	20.32	48.38	21 30 47.29
30	120	39 7 28.7	145.57	0.39	0.003 2357	45.8	16.39	4.79	20.31	48.36	21 26 51.38
May 1	121	40 5 41.6	145.50	+0.48	0.003 3455	+45.7	16.53	-4.82	20.31	48.34	21 22 55.48
2	122	41 3 52.7	145.43	0.53	0.003 4549	45.5	16.67	4.84	20.30	48.32	21 18 59.57
3	123	42 2 2.2	145.36	0.55	0.003 5639	45.3	16.80	4.87	20.30	48.30	21 15 3.66
4	124	43 0 10.1	145.30	0.54	0.003 6724	45.1	16.94	4.89	20.29	48.29	21 11 7.75
5	125	43 58 16.7	145.24	0.50	0.003 7802	44.7	17.08	4.91	20.29	48.27	21 7 11.84
6	126	44 56 21.7	145.18	+0.43	0.003 8871	+44.3	17.22	-4.92	20.28	48.25	21 3 15.94
7	127	45 54 25.4	145.13	0.34	0.003 9930	43.9	17.36	4.94	20.28	48.23	20 59 20.03
8	128	46 52 27.8	145.07	0.23	0.004 0977	43.4	17.49	4.95	20.27	48.21	20 55 24.12
9	129	47 50 28.8	145.01	+0.11	0.004 2011	42.8	17.63	4.97	20.27	48.19	20 51 28.21
10	130	48 48 28.5	144.96	-0.02	0.004 3030	42.1	17.77	4.98	20.26	48.18	20 47 32.30
11	131	49 46 26.8	144.90	-0.15	0.004 4033	+41.5	17.91	-4.99	20.26	48.16	20 43 36.39
12	132	50 44 23.7	144.84	0.27	0.004 5021	40.8	18.04	5.00	20.25	48.14	20 39 40.48
13	133	51 42 19.2	144.78	0.38	0.004 5990	40.0	18.18	5.01	20.25	48.13	20 35 44.57
14	134	52 40 13.3	144.72	0.48	0.004 6942	39.2	18.32	5.01	20.24	48.11	20 31 48.66
15	135	53 38 6.0	144.67	0.56	0.004 7874	38.4	18.46	5.02	20.24	48.09	20 27 52.76
16	136	54 35 57.3	144.61	-0.61	0.004 8787	+37.6	18.59	-5.02	20.24	48.07	20 23 56.35
17	137	55 33 47.1	144.54	-0.64	0.004 9680	+36.8	18.73	-5.02	20.23	48.06	20 20 0.94

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.		Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.		
		h	m	s	s	°	'	"	"	'	"	m	s	s	h	m	s
May	17 Th	3	32	53.01	9.907	+19	9	21.1	+34.44	15 50.57	8.70	+3	45.63	-0.051	3	36	38.64
	18 Fr	3	36	51.07	9.931	19	22	57.8	33.62	15 50.38	8.70	3	44.13	0.074	3	40	35.20
	19 Sa	3	40	49.68	9.953	19	36	14.7	32.79	15 50.19	8.70	3	42.08	0.097	3	44	31.76
	20 Su	3	44	48.82	9.975	19	49	11.6	31.95	15 50.01	8.70	3	39.49	0.119	3	48	28.31
	21 Mo	3	48	48.50	9.998	20	1	48.3	31.10	15 49.83	8.69	3	36.37	0.141	3	52	24.87
	22 Tu	3	52	48.71	10.019	+20	14	4.4	+30.24	15 49.66	8.69	+3	32.72	-0.163	3	56	21.42
	23 We	3	56	49.12	10.040	20	25	59.7	29.37	15 49.49	8.69	3	28.56	0.184	4	0	17.98
	24 Th	4	0	50.64	10.061	20	37	34.0	28.49	15 49.32	8.69	3	23.89	0.205	4	4	14.53
	25 Fr	4	4	52.35	10.082	20	48	47.1	27.60	15 49.16	8.69	3	18.74	0.225	4	8	11.09
	26 Sa	4	8	54.55	10.102	20	59	38.6	26.70	15 49.00	8.69	3	13.09	0.245	4	12	7.65
	27 Su	4	12	57.23	10.121	+21	10	8.4	+25.79	15 48.84	8.68	+3	6.97	-0.265	4	16	4.20
	28 Mo	4	17	0.37	10.140	21	20	16.2	24.87	15 48.68	8.68	3	0.39	0.281	4	20	0.76
	29 Tu	4	21	3.97	10.160	21	30	1.9	23.94	15 48.53	8.68	2	53.34	0.303	4	23	57.31
	30 We	4	25	8.03	10.178	21	39	25.3	23.01	15 48.38	8.68	2	45.84	0.322	4	27	53.87
	31 Th	4	29	12.53	10.196	21	48	26.1	22.06	15 48.23	8.68	2	37.90	0.340	4	31	50.43
June	1 Fr	4	33	17.46	10.214	+21	57	4.2	+21.11	15 48.08	8.68	+2	29.52	-0.358	4	35	46.98
	2 Sa	4	37	22.82	10.232	22	5	19.5	20.16	15 47.94	8.68	2	20.72	0.376	4	39	43.54
	3 Su	4	41	28.59	10.249	22	13	11.7	19.19	15 47.80	8.68	2	11.50	0.392	4	43	40.10
	4 Mo	4	45	34.76	10.265	22	20	40.6	18.22	15 47.66	8.67	2	1.89	0.408	4	47	36.65
	5 Tu	4	49	41.31	10.280	22	27	46.2	17.24	15 47.53	8.67	1	51.90	0.424	4	51	33.21
	6 We	4	53	48.22	10.295	+22	34	28.3	+16.26	15 47.40	8.67	+1	41.55	-0.439	4	55	29.76
	7 Th	4	57	55.47	10.309	22	40	46.7	15.27	15 47.27	8.67	1	30.85	0.453	4	59	26.32
	8 Fr	5	2	3.05	10.322	22	46	41.3	14.28	15 47.15	8.67	1	19.83	0.466	5	3	22.88
	9 Sa	5	6	10.93	10.335	22	52	11.9	13.27	15 47.03	8.67	1	8.50	0.478	5	7	19.43
	10 Su	5	10	19.10	10.346	22	57	18.4	12.27	15 46.92	8.67	0	56.89	0.489	5	11	15.99
	11 Mo	5	14	27.52	10.356	+23	2	0.8	+11.26	15 46.81	8.67	+0	45.03	-0.499	5	15	12.55
	12 Tu	5	18	36.17	10.365	23	6	18.9	10.25	15 46.71	8.67	0	32.93	0.508	5	19	9.10
	13 We	5	22	45.03	10.373	23	10	12.6	9.23	15 46.62	8.66	0	20.63	0.517	5	23	5.66
	14 Th	5	26	54.08	10.381	23	13	41.9	8.21	15 46.52	8.66	+0	8.14	0.524	5	27	2.22
	15 Fr	5	31	3.29	10.387	23	16	46.6	7.18	15 46.44	8.66	-0	4.51	0.530	5	30	58.78
	16 Sa	5	35	12.63	10.391	+23	19	26.7	+ 6.16	15 46.36	8.66	-0	17.29	-0.535	5	34	55.33
	17 Su	5	39	22.06	10.395	23	21	42.1	5.13	15 46.28	8.66	0	30.18	0.539	5	38	51.89
	18 Mo	5	43	31.58	10.398	23	23	32.8	4.10	15 46.21	8.66	0	43.14	0.541	5	42	48.44
	19 Tu	5	47	41.15	10.399	23	24	58.7	3.07	15 46.15	8.66	0	56.15	0.543	5	46	45.00
	20 We	5	51	50.74	10.400	23	25	59.9	2.03	15 46.09	8.66	1	9.18	0.543	5	50	41.56
	21 Th	5	56	0.32	10.399	+23	26	36.2	+ 1.00	15 46.04	8.66	-1	22.21	-0.542	5	54	38.12
	22 Fr	6	0	9.88	10.397	23	26	47.8	- 0.04	15 45.99	8.66	1	35.21	0.541	5	58	34.67
	23 Sa	6	4	19.38	10.394	23	26	34.5	1.07	15 45.94	8.66	1	48.16	0.538	6	2	31.23
	24 Su	6	8	28.81	10.391	23	25	56.4	2.10	15 45.90	8.66	2	1.03	0.534	6	6	27.79
	25 Mo	6	12	38.15	10.387	23	24	53.6	3.13	15 45.86	8.66	2	13.81	0.530	6	10	24.34
	26 Tu	6	16	47.37	10.381	+23	23	26.0	- 4.16	15 45.83	8.66	-2	26.47	-0.525	6	14	20.90
	27 We	6	20	56.45	10.375	23	21	33.8	5.19	15 45.79	8.66	2	39.00	0.519	6	18	17.46
	28 Th	6	25	5.39	10.369	23	19	16.9	6.22	15 45.76	8.66	2	51.37	0.512	6	22	14.01
	29 Fr	6	29	14.15	10.361	23	16	35.4	7.24	15 45.74	8.66	3	3.58	0.505	6	26	10.57
	30 Sa	6	33	22.72	10.353	23	13	29.4	8.26	15 45.72	8.66	3	15.60	0.497	6	30	7.13
July	1 Su	6	37	31.09	10.344	+23	9	59.0	- 9.27	15 45.70	8.66	-3	27.41	-0.488	6	34	3.68
	2 Mo	6	41	39.24	10.335	+23	6	4.3	-10.29	15 45.68	8.66	-3	39.00	-0.478	6	38	0.24

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
May 17	137	55 33 47.1	144.54	-0.64	0.004 9680	+36.8	18.73	-5.02	20.23	48.06	20 20 0.94
18	138	56 31 35.4	144.48	0.64	0.005 0553	36.0	18.87	5.03	20.23	48.04	20 16 5.03
19	139	57 29 22.2	144.42	0.60	0.005 1406	35.2	19.01	5.03	20.22	48.02	20 12 9.12
20	140	58 27 7.4	144.35	0.54	0.005 2240	34.4	19.14	5.02	20.22	48.01	20 8 13.21
21	141	59 24 51.0	144.29	0.46	0.005 3056	33.6	19.28	5.02	20.22	47.99	20 4 17.30
22	142	60 22 33.1	144.22	-0.35	0.005 3853	+32.9	19.42	-5.02	20.21	47.98	20 0 21.39
23	143	61 20 13.5	144.15	0.23	0.005 4633	32.1	19.56	5.01	20.21	47.96	19 56 25.48
24	144	62 17 52.4	144.09	-0.10	0.005 5396	31.5	19.69	5.01	20.20	47.95	19 52 29.57
25	145	63 15 29.7	144.02	+0.02	0.005 6145	30.9	19.83	5.00	20.20	47.93	19 48 33.66
26	146	64 13 5.6	143.96	0.14	0.005 6881	30.4	19.97	4.99	20.20	47.92	19 44 37.75
27	147	65 10 39.9	143.90	+0.26	0.005 7604	+29.9	20.11	-4.98	20.19	47.91	19 40 41.84
28	148	66 8 12.9	143.85	0.35	0.005 8315	29.4	20.24	4.97	20.19	47.89	19 36 45.93
29	149	67 5 44.6	143.80	0.41	0.005 9016	29.0	20.38	4.96	20.19	47.88	19 32 50.02
30	150	68 3 15.2	143.75	0.42	0.005 9707	28.6	20.52	4.95	20.18	47.87	19 28 54.11
31	151	69 0 44.7	143.71	0.42	0.006 0387	28.1	20.66	4.93	20.18	47.86	19 24 58.20
June 1	152	69 58 13.2	143.67	+0.38	0.006 1055	+27.6	20.80	-4.92	20.18	47.85	19 21 2.29
2	153	70 55 40.8	143.64	0.32	0.006 1712	27.1	20.93	4.90	20.18	47.84	19 17 6.38
3	154	71 53 7.7	143.61	0.23	0.006 2355	26.5	21.07	4.89	20.17	47.83	19 13 10.47
4	155	72 50 33.9	143.58	+0.11	0.006 2984	25.9	21.21	4.87	20.17	47.82	19 9 14.56
5	156	73 47 59.3	143.55	-0.01	0.006 3596	25.1	21.35	4.85	20.17	47.81	19 5 18.65
6	157	74 45 24.1	143.52	-0.13	0.006 4191	+24.4	21.48	-4.83	20.16	47.80	19 1 22.73
7	158	75 42 48.3	143.50	0.25	0.006 4767	23.6	21.62	4.82	20.16	47.79	18 57 26.82
8	159	76 40 11.9	143.47	0.37	0.006 5324	22.8	21.76	4.80	20.16	47.78	18 53 30.91
9	160	77 37 34.9	143.45	0.49	0.006 5860	21.9	21.90	4.78	20.16	47.77	18 49 35.00
10	161	78 34 57.3	143.42	0.58	0.006 6374	20.9	22.03	4.75	20.15	47.77	18 45 39.09
11	162	79 32 19.1	143.40	-0.65	0.006 6865	+20.0	22.17	-4.73	20.15	47.76	18 41 43.18
12	163	80 29 40.4	143.37	0.70	0.006 7333	19.0	22.31	4.71	20.15	47.76	18 37 47.27
13	164	81 27 1.0	143.35	0.73	0.006 7777	18.0	22.45	4.69	20.15	47.75	18 33 51.36
14	165	82 24 21.0	143.32	0.74	0.006 8196	16.9	22.58	4.67	20.15	47.75	18 29 55.45
15	166	83 21 40.4	143.29	0.71	0.006 8590	15.9	22.72	4.64	20.14	47.74	18 25 59.54
16	167	84 18 59.1	143.26	-0.65	0.006 8958	+14.8	22.86	-4.62	20.14	47.74	18 22 3.63
17	168	85 16 17.1	143.23	0.57	0.006 9302	13.8	23.00	4.60	20.14	47.74	18 18 7.72
18	169	86 13 34.4	143.20	0.47	0.006 9621	12.8	23.13	4.57	20.14	47.74	18 14 11.81
19	170	87 10 50.9	143.17	0.35	0.006 9916	11.8	23.27	4.55	20.14	47.74	18 10 15.90
20	171	88 8 6.7	143.14	0.22	0.007 0188	10.9	23.41	4.52	20.14	47.74	18 6 19.98
21	172	89 5 21.8	143.11	-0.09	0.007 0439	+10.0	23.55	-4.50	20.14	47.74	18 2 24.07
22	173	90 2 36.1	143.08	+0.03	0.007 0669	9.2	23.69	4.48	20.13	47.74	17 58 28.16
23	174	90 59 49.7	143.05	0.15	0.007 0879	8.4	23.82	4.45	20.13	47.74	17 54 32.25
24	175	91 57 2.7	143.03	0.24	0.007 1072	7.7	23.96	4.43	20.13	47.74	17 50 36.34
25	176	92 54 15.1	143.01	0.30	0.007 1249	7.0	24.10	4.40	20.13	47.74	17 46 40.43
26	177	93 51 27.0	142.99	+0.33	0.007 1410	+ 6.4	24.24	-4.38	20.13	47.75	17 42 44.52
27	178	94 48 38.4	142.97	0.32	0.007 1556	5.8	24.37	4.36	20.13	47.75	17 38 48.61
28	179	95 45 49.6	142.96	0.29	0.007 1689	5.2	24.51	4.33	20.13	47.75	17 34 52.70
29	180	96 43 0.5	142.95	0.23	0.007 1807	4.6	24.65	4.31	20.13	47.76	17 30 56.79
30	181	97 40 11.3	142.95	0.14	0.007 1912	4.0	24.79	4.29	20.13	47.76	17 27 0.88
July 1	182	98 37 22.2	142.95	+0.03	0.007 2001	+ 3.4	24.92	-4.27	20.13	47.77	17 23 4.96
2	183	99 34 33.1	142.96	-0.09	0.007 2075	+ 2.7	25.06	-4.24	20.13	47.78	17 19 9.05

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time, App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h	m	s	s	°	'	"	"	'	"	m	s	h m s
July	1 Su	6	37	31.09	10.344	+23	9	59.0	-9.27	15 45.70	8.66	-3 27.41	-0.488	6 34 3.68
	2 Mo	6	41	39.24	10.335	23	6	4.3	10.29	15 45.68	8.66	3 39.00	0.478	6 38 0.24
	3 Tu	6	45	47.14	10.324	23	1	45.3	11.30	15 45.67	8.66	3 50.34	0.467	6 41 56.80
	4 We	6	49	54.78	10.312	22	57	2.2	12.30	15 45.66	8.66	4 1.42	0.456	6 45 53.35
	5 Th	6	54	2.13	10.300	22	51	55.1	13.30	15 45.66	8.66	4 12.22	0.444	6 49 49.91
	6 Fr	6	58	9.19	10.288	+22	46	24.1	-14.29	15 45.66	8.66	-4 22.72	-0.431	6 53 46.47
	7 Sa	7	2	15.93	10.274	22	40	29.4	15.27	15 45.66	8.66	4 32.90	0.417	6 57 43.02
	8 Su	7	6	22.32	10.259	22	34	11.1	16.25	15 45.67	8.66	4 42.74	0.402	7 1 39.58
	9 Mo	7	10	28.35	10.243	22	27	29.3	17.23	15 45.68	8.66	4 52.21	0.387	7 5 36.14
	10 Tu	7	14	34.00	10.227	22	20	24.2	18.20	15 45.70	8.66	5 1.30	0.371	7 9 32.69
	11 We	7	18	39.24	10.210	+22	12	56.0	-19.16	15 45.73	8.66	-5 9.99	-0.354	7 13 29.25
	12 Th	7	22	44.07	10.192	22	5	4.8	20.11	15 45.76	8.66	5 18.27	0.336	7 17 25.80
	13 Fr	7	26	48.46	10.173	21	56	50.9	21.05	15 45.79	8.66	5 26.10	0.317	7 21 22.36
	14 Sa	7	30	52.39	10.154	21	48	14.4	21.99	15 45.83	8.66	5 33.47	0.297	7 25 18.92
	15 Su	7	34	55.84	10.134	21	39	15.6	22.91	15 45.88	8.66	5 40.37	0.277	7 29 15.47
	16 Mo	7	38	58.80	10.113	+21	29	54.6	-23.83	15 45.94	8.66	-5 46.77	-0.256	7 33 12.03
	17 Tu	7	43	1.24	10.091	21	20	11.7	21.74	15 45.99	8.66	5 52.65	0.234	7 37 8.59
	18 We	7	47	3.15	10.068	21	10	7.0	25.64	15 46.06	8.66	5 58.00	0.212	7 41 5.14
	19 Th	7	51	4.51	10.045	20	59	40.9	26.53	15 46.13	8.66	6 2.81	0.189	7 45 1.70
	20 Fr	7	55	5.31	10.022	20	48	53.5	27.41	15 46.20	8.66	6 7.06	0.165	7 48 58.25
	21 Sa	7	59	5.55	9.998	+20	37	45.1	-28.28	15 46.28	8.66	-6 10.74	-0.141	7 52 54.81
	22 Su	8	3	5.21	9.974	20	26	15.9	29.15	15 46.36	8.66	6 13.84	0.117	7 56 51.36
	23 Mo	8	7	4.28	9.949	20	14	26.2	30.00	15 46.45	8.66	6 16.36	0.093	8 0 47.92
	24 Tu	8	11	2.76	9.924	20	2	16.2	30.83	15 46.54	8.66	6 18.28	0.068	8 4 44.48
	25 We	8	15	0.64	9.899	19	49	46.2	31.66	15 46.63	8.66	6 19.61	0.043	8 8 41.03
	26 Th	8	18	57.93	9.875	+19	36	56.4	-32.48	15 46.73	8.67	-6 20.34	-0.018	8 12 37.59
	27 Fr	8	22	54.62	9.850	19	23	47.0	33.29	15 46.83	8.67	6 20.48	+0.007	8 16 34.14
	28 Sa	8	26	50.71	9.825	19	10	18.3	34.09	15 46.93	8.67	6 20.01	0.032	8 20 30.70
	29 Su	8	30	46.21	9.800	18	56	30.7	34.88	15 47.03	8.67	6 18.95	0.056	8 24 27.25
	30 Mo	8	34	41.11	9.775	18	42	24.3	35.65	15 47.14	8.67	6 17.30	0.081	8 28 23.81
	31 Tu	8	38	35.41	9.750	+18	27	59.4	-36.42	15 47.25	8.67	-6 15.05	+0.106	8 32 20.36
Aug.	1 We	8	42	29.13	9.726	18	13	16.3	37.17	15 47.37	8.67	6 12.21	0.131	8 36 16.92
	2 Th	8	46	22.25	9.701	17	58	15.3	37.91	15 47.48	8.67	6 8.78	0.155	8 40 13.47
	3 Fr	8	50	14.79	9.677	17	42	56.6	38.64	15 47.60	8.67	6 4.76	0.180	8 44 10.03
	4 Sa	8	54	6.74	9.652	17	27	20.6	39.36	15 47.73	8.67	6 0.16	0.204	8 48 6.58
	5 Su	8	57	58.10	9.628	+17	11	27.5	-40.06	15 47.86	8.68	-5 54.96	+0.229	8 52 3.14
	6 Mo	9	1	48.88	9.604	16	55	17.7	40.75	15 47.99	8.68	5 49.19	0.253	8 55 59.69
	7 Tu	9	5	39.08	9.580	16	38	51.4	41.43	15 48.13	8.68	5 42.84	0.277	8 59 56.24
	8 We	9	9	28.71	9.556	16	22	8.9	42.10	15 48.27	8.68	5 35.90	0.301	9 3 52.80
	9 Th	9	13	17.76	9.532	16	5	10.6	42.76	15 48.41	8.68	5 28.40	0.324	9 7 49.35
	10 Fr	9	17	6.23	9.508	+15	47	56.7	-43.40	15 48.56	8.68	-5 20.33	+0.348	9 11 45.91
	11 Sa	9	20	54.14	9.485	15	30	27.5	44.03	15 48.72	8.68	5 11.68	0.372	9 15 42.46
	12 Su	9	24	41.49	9.461	15	12	43.5	44.65	15 48.88	8.69	5 2.47	0.395	9 19 39.02
	13 Mo	9	28	28.27	9.437	14	54	44.8	45.25	15 49.05	8.69	4 52.70	0.419	9 23 35.57
	14 Tu	9	32	14.49	9.414	14	36	31.9	45.83	15 49.22	8.69	4 42.37	0.442	9 27 32.12
	15 We	9	36	0.16	9.391	+14	18	5.1	-46.40	15 49.39	8.69	-4 31.48	+0.465	9 31 28.68
	16 Th	9	39	45.27	9.368	+13	59	24.6	-46.96	15 49.57	8.69	-4 20.04	+0.488	9 35 25.23

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliqu-uity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
July	1	182 98 37 22.2	142.95	+0.03	0.007 2001	+ 3.4	24.92	-4.27	20.13	47.77	17 23 4.96
	2	183 99 34 33.1	142.96	-0.09	0.007 2075	2.7	25.06	4.24	20.13	47.78	17 19 9.05
	3	184 100 31 44.1	142.96	0.21	0.007 2132	2.0	25.20	4.22	20.13	47.79	17 15 13.14
	4	185 101 28 55.3	142.97	0.33	0.007 2171	1.3	25.34	4.20	20.13	47.79	17 11 17.23
	5	186 102 26 6.8	142.99	0.46	0.007 2192	+ 0.4	25.47	4.18	20.13	47.80	17 7 21.32
	6	187 103 23 18.6	143.00	-0.58	0.007 2192	- 0.4	25.61	-4.16	20.13	47.81	17 3 25.41
	7	188 104 20 30.7	143.01	0.68	0.007 2171	1.3	25.75	4.14	20.13	47.82	16 59 29.50
	8	189 105 17 43.2	143.02	0.75	0.007 2128	2.2	25.89	4.12	20.13	47.83	16 55 33.59
	9	190 106 14 55.9	143.04	0.80	0.007 2063	3.2	26.02	4.10	20.13	47.84	16 51 37.68
	10	191 107 12 9.1	143.06	0.83	0.007 1973	4.2	26.16	4.09	20.13	47.85	16 47 41.77
	11	192 108 9 22.6	143.07	-0.83	0.007 1860	- 5.2	26.30	-4.07	20.13	47.86	16 43 45.86
	12	193 109 6 36.4	143.08	0.81	0.007 1721	6.3	26.44	4.06	20.13	47.88	16 39 49.95
	13	194 110 3 50.6	143.10	0.75	0.007 1656	7.4	26.58	4.04	20.13	47.89	16 35 54.04
	14	195 111 1 5.2	143.11	0.66	0.007 1365	8.5	26.71	4.03	20.13	47.90	16 31 58.13
	15	196 111 58 20.0	143.12	0.56	0.007 1148	9.6	26.85	4.01	20.13	47.91	16 28 2.22
	16	197 112 55 35.0	143.13	-0.45	0.007 0905	-10.7	26.99	-4.00	20.13	47.93	16 24 6.31
	17	198 113 52 50.3	143.14	0.32	0.007 0636	11.7	27.13	3.99	20.13	47.95	16 20 10.40
	18	199 114 50 5.8	143.15	0.19	0.007 0343	12.7	27.26	3.98	20.14	47.96	16 16 14.49
	19	200 115 47 21.5	143.16	-0.06	0.007 0026	13.7	27.40	3.97	20.14	47.97	16 12 18.58
	20	201 116 44 37.3	143.16	+0.06	0.006 9687	14.5	27.54	3.97	20.14	47.99	16 8 22.67
	21	202 117 41 53.4	143.17	+0.16	0.006 9328	-15.4	27.68	-3.96	20.14	48.01	16 4 26.76
	22	203 118 39 9.7	143.18	0.23	0.006 8949	16.2	27.81	3.95	20.14	48.02	16 0 30.85
	23	204 119 36 26.2	143.20	0.27	0.006 8552	16.9	27.95	3.95	20.14	48.04	15 56 34.94
	24	205 120 33 43.1	143.21	0.28	0.006 8140	17.5	28.09	3.95	20.15	48.06	15 52 39.03
	25	206 121 31 0.4	143.23	0.26	0.006 7712	18.1	28.23	3.94	20.15	48.07	15 48 43.12
	26	207 122 28 18.2	143.25	+0.20	0.006 7271	-18.7	28.36	-3.94	20.15	48.09	15 44 47.21
	27	208 123 25 36.6	143.28	+0.11	0.006 6816	19.2	28.50	3.94	20.15	48.11	15 40 51.30
	28	209 124 22 55.7	143.31	0.00	0.006 6348	19.8	28.64	3.95	20.15	48.13	15 36 55.39
	29	210 125 20 15.6	143.35	-0.12	0.006 5867	20.3	28.78	3.95	20.16	48.15	15 32 59.48
	30	211 126 17 36.4	143.39	0.25	0.006 5372	20.9	28.91	3.95	20.16	48.16	15 29 3.57
	31	212 127 14 58.1	143.43	-0.37	0.006 4864	-21.5	29.05	-3.96	20.16	48.18	15 25 7.66
Aug.	1	213 128 12 20.9	143.47	0.50	0.006 4342	22.1	29.19	3.96	20.16	48.20	15 21 11.75
	2	214 129 9 44.7	143.52	0.63	0.006 3804	22.8	29.33	3.97	20.17	48.22	15 17 15.84
	3	215 130 7 9.7	143.57	0.73	0.006 3249	23.5	29.46	3.98	20.17	48.24	15 13 19.94
	4	216 131 4 35.9	143.62	0.81	0.006 2678	24.2	29.60	3.99	20.17	48.26	15 9 24.03
	5	217 132 2 3.3	143.67	-0.87	0.006 2089	-24.9	29.74	-4.01	20.17	48.28	15 5 28.12
	6	218 132 59 31.9	143.72	0.91	0.006 1481	25.7	29.88	4.02	20.18	48.30	15 1 32.21
	7	219 133 57 1.8	143.77	0.92	0.006 0854	26.6	30.02	4.04	20.18	48.32	14 57 36.30
	8	220 134 54 33.0	143.82	0.89	0.006 0206	27.4	30.15	4.05	20.18	48.34	14 53 40.39
	9	221 135 52 5.4	143.88	0.83	0.005 9538	28.3	30.29	4.07	20.19	48.36	14 49 44.48
	10	222 136 49 39.2	143.93	-0.75	0.005 8847	-29.2	30.43	-4.09	20.19	48.38	14 45 48.58
	11	223 137 47 14.2	143.98	0.66	0.005 8134	30.2	30.57	4.11	20.19	48.40	14 41 52.67
	12	224 138 44 50.4	144.03	0.55	0.005 7399	31.1	30.70	4.13	20.20	48.42	14 37 56.76
	13	225 139 42 27.8	144.08	0.41	0.005 6640	32.1	30.84	4.16	20.20	48.44	14 34 0.85
	14	226 140 40 6.4	144.13	0.26	0.005 5858	33.0	30.98	4.18	20.20	48.46	14 30 4.94
	15	227 141 37 46.0	144.17	-0.13	0.005 5055	-33.9	31.12	-4.21	20.21	48.48	14 26 9.04
	16	228 142 35 26.7	144.22	-0.01	0.005 4230	-34.8	31.25	-4.23	20.21	48.50	14 22 13.13

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App. Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Aug. 16	Th	9 39 45.27	9.368	+13 59 24.6	-46.96	15 49.57	8.69	- 4 20.04	+0.488	9 35 25.23
17	Fr	9 43 29.84	9.316	13 40 30.8	47.51	15 49.76	8.69	4 8.05	0.511	9 39 21.78
18	Sa	9 47 13.87	9.323	13 21 24.1	48.05	15 49.95	8.69	3 55.53	0.533	9 43 18.34
19	Su	9 50 57.37	9.302	13 2 4.7	48.57	15 50.14	8.70	3 42.48	0.555	9 47 14.89
20	Mo	9 54 40.36	9.281	12 42 33.0	49.08	15 50.33	8.70	3 28.91	0.576	9 51 11.44
21	Tu	9 58 22.84	9.260	+12 22 49.2	-49.57	15 50.53	8.70	- 3 14.84	+0.597	9 55 8.00
22	We	10 2 4.83	9.210	12 2 53.8	50.05	15 50.73	8.70	3 0.28	0.617	9 59 4.55
23	Th	10 5 46.35	9.220	11 42 46.9	50.52	15 50.94	8.70	2 45.24	0.636	10 3 1.10
24	Fr	10 9 27.41	9.202	11 22 29.0	50.98	15 51.14	8.71	2 29.75	0.655	10 6 57.66
25	Sa	10 13 8.03	9.184	11 2 0.2	51.42	15 51.35	8.71	2 13.82	0.673	10 10 54.21
26	Su	10 16 48.23	9.166	+10 41 21.0	-51.85	15 51.56	8.71	- 1 57.46	+0.690	10 14 50.76
27	Mo	10 20 28.02	9.150	10 20 31.7	52.26	15 51.77	8.71	1 40.70	0.706	10 18 47.32
28	Tu	10 24 7.43	9.134	9 59 32.4	52.67	15 51.98	8.71	1 23.56	0.722	10 22 43.87
29	We	10 27 46.47	9.119	9 38 23.6	53.06	15 52.20	8.72	1 6.05	0.737	10 26 40.42
30	Th	10 31 25.17	9.105	9 17 5.5	53.44	15 52.41	8.72	0 48.19	0.751	10 30 36.98
31	Fr	10 35 3.53	9.092	+ 8 55 38.5	-53.81	15 52.63	8.72	- 0 30.00	+0.764	10 34 33.53
Sept. 1	Sa	10 38 41.58	9.079	8 34 2.8	54.16	15 52.85	8.72	- 0 11.50	0.777	10 38 30.08
2	Su	10 42 19.34	9.067	8 12 18.9	54.50	15 53.07	8.72	+ 0 7.29	0.789	10 42 26.63
3	Mo	10 45 56.82	9.056	7 50 26.9	54.83	15 53.30	8.73	0 26.37	0.800	10 46 23.18
4	Tu	10 49 34.04	9.046	7 28 27.2	55.11	15 53.53	8.73	0 45.70	0.810	10 50 19.74
5	We	10 53 11.02	9.036	+ 7 6 20.2	-55.44	15 53.76	8.73	+ 1 5.27	+0.820	10 54 16.29
6	Th	10 56 47.77	9.027	6 44 6.2	55.73	15 53.99	8.73	1 25.07	0.829	10 58 12.84
7	Fr	11 0 24.32	9.019	6 21 45.5	56.00	15 54.23	8.73	1 45.07	0.838	11 2 9.39
8	Sa	11 4 0.68	9.011	5 59 18.4	56.26	15 54.47	8.74	2 5.27	0.845	11 6 5.95
9	Su	11 7 36.86	9.004	5 36 45.2	56.50	15 54.71	8.74	2 25.64	0.852	11 10 2.50
10	Mo	11 11 12.88	8.998	+ 5 14 6.4	-56.73	15 54.95	8.74	+ 2 46.17	+0.859	11 13 59.05
11	Tu	11 14 48.75	8.992	4 51 22.2	56.95	15 55.20	8.74	3 6.85	0.865	11 17 55.60
12	We	11 18 24.49	8.987	4 28 33.1	57.15	15 55.46	8.75	3 27.66	0.870	11 21 52.15
13	Th	11 22 0.11	8.982	4 5 39.3	57.33	15 55.71	8.75	3 48.59	0.875	11 25 48.71
14	Fr	11 25 35.63	8.978	3 42 41.2	57.50	15 55.97	8.75	4 9.63	0.878	11 29 45.26
15	Sa	11 29 11.06	8.975	+ 3 19 39.2	-57.66	15 56.24	8.75	+ 4 30.75	+0.882	11 33 41.81
16	Su	11 32 46.42	8.972	2 56 33.5	57.80	15 56.50	8.75	4 51.95	0.884	11 37 38.36
17	Mo	11 36 21.72	8.970	2 33 24.6	57.93	15 56.77	8.76	5 13.19	0.886	11 41 34.91
18	Tu	11 39 57.00	8.969	2 10 12.9	58.05	15 57.04	8.76	5 34.47	0.887	11 45 31.47
19	We	11 43 32.26	8.969	1 46 58.5	58.15	15 57.31	8.76	5 55.76	0.887	11 49 28.02
20	Th	11 47 7.54	8.970	+ 1 23 41.8	-58.24	15 57.58	8.76	+ 6 17.03	+0.886	11 53 24.57
21	Fr	11 50 42.85	8.972	1 0 23.2	58.31	15 57.85	8.77	6 38.27	0.884	11 57 21.12
22	Sa	11 54 18.22	8.975	0 37 3.0	58.37	15 58.12	8.77	6 59.46	0.881	12 1 17.67
23	Su	11 57 53.66	8.979	+ 0 13 41.6	58.42	15 58.39	8.77	7 20.56	0.877	12 5 14.22
24	Mo	12 1 29.21	8.984	- 0 9 40.9	58.45	15 58.66	8.77	7 41.56	0.872	12 9 10.78
25	Tu	12 5 4.89	8.990	- 0 33 3.9	-58.47	15 58.93	8.78	+ 8 2.43	+0.867	12 13 7.33
26	We	12 8 40.73	8.997	0 56 27.3	58.48	15 59.21	8.78	8 23.15	0.860	12 17 3.88
27	Th	12 12 16.74	9.005	1 19 50.6	58.47	15 59.48	8.78	8 43.70	0.852	12 21 0.43
28	Fr	12 15 52.95	9.013	1 43 13.6	58.45	15 59.75	8.78	9 4.04	0.843	12 24 56.98
29	Sa	12 19 29.38	9.023	2 6 35.9	58.41	16 0.02	8.79	9 24.16	0.833	12 28 53.54
30	Su	12 23 6.05	9.034	- 2 29 57.2	-58.36	16 0.29	8.79	+ 9 44.03	+0.823	12 32 50.09
Oct. 1	Mo	12 26 43.00	9.045	- 2 53 17.1	-58.30	16 0.56	8.79	+10 3.64	+0.811	12 36 46.64

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26'	h m s
Aug. 16	228	142 35 26.7	144.22	-0.01	0.005 4230	-34.8	31.25	-4.23	20.21	48.50	14 22 13.13
17	229	143 33 8.5	144.26	+0.10	0.005 3385	35.6	31.39	4.26	20.22	48.52	14 18 17.22
18	230	144 30 51.3	144.30	0.18	0.005 2522	36.3	31.53	4.29	20.22	48.53	14 14 21.31
19	231	145 28 35.1	144.35	0.24	0.005 1643	36.9	31.67	4.33	20.22	48.55	14 10 25.41
20	232	146 26 19.9	144.39	0.26	0.005 0749	37.5	31.80	4.36	20.23	48.57	14 6 29.50
21	233	147 24 5.9	144.44	+0.24	0.004 9842	-38.0	31.94	-4.39	20.23	48.59	14 2 33.59
22	234	148 21 53.0	144.49	0.19	0.004 8923	38.5	32.08	4.43	20.24	48.61	13 58 37.68
23	235	149 19 41.3	144.54	0.11	0.004 7993	38.9	32.22	4.46	20.24	48.63	13 54 41.78
24	236	150 17 31.0	144.60	+0.01	0.004 7055	39.3	32.35	4.50	20.24	48.64	13 50 45.87
25	237	151 15 22.0	144.66	-0.11	0.004 6107	39.6	32.49	4.54	20.25	48.66	13 46 49.96
26	238	152 13 14.4	144.72	-0.24	0.004 5152	-40.0	32.63	-4.58	20.25	48.68	13 42 54.06
27	239	153 11 8.4	144.78	0.37	0.004 4189	40.3	32.77	4.62	20.26	48.69	13 38 58.15
28	240	154 9 4.0	144.85	0.50	0.004 3219	40.6	32.91	4.67	20.26	48.71	13 35 2.24
29	241	155 7 1.3	144.92	0.62	0.004 2240	40.9	33.04	4.71	20.27	48.73	13 31 6.34
30	242	156 5 0.3	145.00	0.73	0.004 1254	41.3	33.18	4.76	20.27	48.74	13 27 10.43
31	243	157 3 1.2	145.07	-0.82	0.004 0258	-41.7	33.32	-4.80	20.28	48.76	13 23 14.52
Sept. 1	244	158 1 3.9	145.15	0.89	0.003 9253	42.1	33.46	4.85	20.28	48.77	13 19 18.62
2	245	158 59 8.5	145.23	0.93	0.003 8239	42.5	33.59	4.90	20.28	48.79	13 15 22.71
3	246	159 57 15.0	145.31	0.94	0.003 7213	43.0	33.73	4.95	20.29	48.80	13 11 26.80
4	247	160 55 23.5	145.40	0.93	0.003 6176	43.4	33.87	5.00	20.29	48.81	13 7 30.90
5	248	161 53 34.0	145.48	-0.89	0.003 5128	-43.9	34.01	-5.05	20.30	48.83	13 3 34.99
6	249	162 51 46.4	145.56	0.82	0.003 4067	44.5	34.14	5.10	20.30	48.84	12 59 39.08
7	250	163 50 0.9	145.65	0.72	0.003 2992	45.1	34.28	5.15	20.31	48.85	12 55 43.18
8	251	164 48 17.4	145.73	0.60	0.003 1903	45.7	34.42	5.20	20.31	48.86	12 51 47.27
9	252	165 46 35.7	145.80	0.47	0.003 0798	46.4	34.56	5.26	20.32	48.87	12 47 51.36
10	253	166 44 56.0	145.88	-0.33	0.002 9678	-47.0	34.69	-5.31	20.32	48.88	12 43 55.46
11	254	167 43 18.2	145.96	0.19	0.002 8542	47.7	34.83	5.37	20.33	48.89	12 39 59.55
12	255	168 41 42.1	146.03	-0.05	0.002 7390	48.3	34.97	5.42	20.34	48.90	12 36 3.65
13	256	169 40 7.8	146.10	+0.07	0.002 6224	48.9	35.11	5.48	20.34	48.91	12 32 7.74
14	257	170 38 35.1	146.17	0.16	0.002 5044	49.4	35.24	5.54	20.35	48.92	12 28 11.83
15	258	171 37 4.1	146.24	+0.22	0.002 3852	-49.9	35.38	-5.60	20.35	48.93	12 24 15.93
16	259	172 35 34.6	146.31	0.25	0.002 2649	50.3	35.52	5.65	20.36	48.93	12 20 20.02
17	260	173 34 6.8	146.38	0.25	0.002 1437	50.6	35.66	5.71	20.36	48.94	12 16 24.12
18	261	174 32 46.6	146.44	0.21	0.002 0219	50.9	35.80	5.77	20.37	48.94	12 12 28.21
19	262	175 31 26.0	146.51	0.15	0.001 8995	51.1	35.93	5.83	20.37	48.95	12 8 32.30
20	263	176 29 53.1	146.58	+0.06	0.001 7767	-51.2	36.07	-5.89	20.38	48.95	12 4 36.40
21	264	177 28 31.9	146.65	-0.05	0.001 6537	51.3	36.21	5.95	20.39	48.96	12 0 40.49
22	265	178 27 12.5	146.73	0.17	0.001 5307	51.3	36.35	6.01	20.39	48.96	11 56 44.59
23	266	179 25 54.9	146.81	0.30	0.001 4076	51.3	36.48	6.07	20.40	48.96	11 52 48.68
24	267	180 24 39.3	146.89	0.43	0.001 2845	51.2	36.62	6.13	20.40	48.96	11 48 52.78
25	268	181 23 25.6	146.97	-0.55	0.001 1616	-51.2	36.76	-6.18	20.41	48.96	11 44 56.87
26	269	182 22 13.9	147.06	0.66	0.001 0388	51.1	36.90	6.24	20.42	48.97	11 41 0.96
27	270	183 21 4.3	147.14	0.75	0.000 9161	51.1	37.03	6.30	20.42	48.97	11 37 5.06
28	271	184 19 56.8	147.23	0.82	0.000 7936	51.0	37.17	6.36	20.43	48.96	11 33 9.15
29	272	185 18 51.5	147.33	0.87	0.000 6711	51.0	37.31	6.42	20.43	48.96	11 29 13.25
30	273	186 17 48.5	147.42	-0.88	0.000 5488	-51.0	37.45	-6.48	20.44	48.96	11 25 17.34
Oct. 1	274	187 16 47.7	147.51	-0.87	0.000 4265	-51.0	37.58	-6.54	20.44	48.96	11 21 21.43

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Oct. 1	Mo	12 26 43.00	9.045	— 2 53 17.1	—58.30	16 0.56	8.79	+10 3.64	+0.811	12 36 46.64
2	Tu	12 30 20.23	9.057	3 16 35.3	58.22	16 0.83	8.79	10 22.96	0.799	12 40 43.19
3	We	12 33 57.77	9.071	3 39 51.5	58.13	16 1.10	8.80	10 41.97	0.785	12 44 39.74
4	Th	12 37 35.65	9.086	4 3 5.2	58.02	16 1.37	8.80	11 0.64	0.771	12 48 36.29
5	Fr	12 41 13.88	9.101	4 26 16.2	57.89	16 1.64	8.80	11 18.97	0.756	12 52 32.84
6	Sa	12 44 52.48	9.116	— 4 49 24.0	—57.76	16 1.91	8.80	+11 36.92	+0.740	12 56 29.40
7	Su	12 48 31.47	9.133	5 12 28.4	57.61	16 2.19	8.81	11 54.48	0.723	13 0 25.95
8	Mo	12 52 10.86	9.150	5 35 28.9	57.44	16 2.46	8.81	12 11.64	0.706	13 4 22.50
9	Tu	12 55 50.68	9.168	5 58 25.1	57.25	16 2.74	8.81	12 28.37	0.688	13 8 19.05
10	We	12 59 30.94	9.187	6 21 16.7	57.05	16 3.02	8.81	12 44.67	0.670	13 12 15.61
11	Th	13 3 11.64	9.206	— 6 44 3.3	—56.83	16 3.30	8.82	+13 0.51	+0.651	13 16 12.16
12	Fr	13 6 52.82	9.226	7 6 44.5	56.60	16 3.58	8.82	13 15.89	0.631	13 20 8.71
13	Sa	13 10 34.47	9.246	7 29 19.8	56.35	16 3.86	8.82	13 30.79	0.611	13 24 5.26
14	Su	13 14 16.62	9.267	7 51 48.9	56.08	16 4.14	8.82	13 45.20	0.590	13 28 1.82
15	Mo	13 17 59.27	9.288	8 14 11.4	55.79	16 4.42	8.83	13 59.09	0.568	13 31 58.37
16	Tu	13 21 42.46	9.310	— 8 36 26.9	—55.49	16 4.70	8.83	+14 12.46	+0.546	13 35 54.92
17	We	13 25 26.18	9.333	8 58 35.0	55.18	16 4.98	8.83	14 25.29	0.523	13 39 51.47
18	Th	13 29 10.47	9.358	9 20 35.3	54.85	16 5.26	8.83	14 37.55	0.499	13 43 48.02
19	Fr	13 32 55.35	9.382	9 42 27.4	54.50	16 5.54	8.84	14 49.23	0.474	13 47 44.58
20	Sa	13 36 40.82	9.407	10 4 11.1	54.14	16 5.82	8.84	15 0.31	0.449	13 51 41.13
21	Su	13 40 26.91	9.434	—10 25 45.8	—53.75	16 6.09	8.84	+15 10.78	+0.423	13 55 37.68
22	Mo	13 44 13.64	9.461	10 47 11.2	53.36	16 6.36	8.84	15 20.60	0.395	13 59 34.24
23	Tu	13 48 1.03	9.488	11 8 26.9	52.95	16 6.63	8.85	15 29.76	0.368	14 3 30.79
24	We	13 51 49.09	9.517	11 29 32.6	52.52	16 6.90	8.85	15 38.26	0.340	14 7 27.34
25	Th	13 55 37.84	9.546	11 50 27.9	52.08	16 7.17	8.85	15 46.06	0.310	14 11 23.90
26	Fr	13 59 27.31	9.576	—12 11 12.3	—51.62	16 7.43	8.85	+15 53.14	+0.280	14 15 20.45
27	Sa	14 3 17.50	9.607	12 31 45.5	51.14	16 7.69	8.86	15 59.50	0.250	14 19 17.00
28	Su	14 7 8.44	9.638	12 52 7.1	50.65	16 7.95	8.86	16 5.12	0.218	14 23 13.56
29	Mo	14 11 0.13	9.670	13 12 16.7	50.15	16 8.20	8.86	16 9.98	0.186	14 27 10.11
30	Tu	14 14 52.60	9.703	13 32 14.0	49.62	16 8.45	8.86	16 14.06	0.154	14 31 6.66
31	We	14 18 45.86	9.736	—13 51 58.4	—49.08	16 8.70	8.87	+16 17.36	+0.121	14 35 3.22
Nov 1	Th	14 22 39.91	9.769	14 11 29.7	48.53	16 8.95	8.87	16 19.86	0.087	14 38 59.77
2	Fr	14 26 34.78	9.803	14 30 47.5	47.95	16 9.20	8.87	16 21.54	0.053	14 42 56.32
3	Sa	14 30 30.47	9.837	14 49 51.3	47.36	16 9.44	8.87	16 22.41	+0.019	14 46 52.88
4	Su	14 34 26.98	9.872	15 8 40.6	46.75	16 9.68	8.87	16 22.45	—0.016	14 50 49.43
5	Mo	14 38 24.33	9.907	—15 27 15.2	—46.13	16 9.92	8.88	+16 21.65	—0.051	14 54 45.99
6	Tu	14 42 22.53	9.942	15 45 34.6	45.49	16 10.16	8.88	16 20.02	0.086	14 58 42.54
7	We	14 46 21.56	9.977	16 3 38.4	44.83	16 10.39	8.88	16 17.54	0.121	15 2 39.10
8	Th	14 50 21.43	10.012	16 21 26.1	44.15	16 10.63	8.88	16 14.21	0.156	15 6 35.65
9	Fr	14 54 22.15	10.048	16 38 57.4	43.46	16 10.87	8.89	16 10.05	0.191	15 10 32.20
10	Sa	14 58 23.71	10.083	—16 56 11.8	—42.74	16 11.10	8.89	+16 5.05	—0.226	15 14 28.76
11	Su	15 2 26.11	10.117	17 13 8.8	42.01	16 11.33	8.89	15 59.21	0.261	15 18 25.31
12	Mo	15 6 29.34	10.152	17 29 48.1	41.26	16 11.56	8.89	15 52.53	0.295	15 22 21.87
13	Tu	15 10 33.40	10.186	17 46 9.2	40.50	16 11.79	8.89	15 45.03	0.330	15 26 18.42
14	We	15 14 38.29	10.221	18 2 11.8	39.72	16 12.02	8.90	15 36.69	0.365	15 30 14.98
15	Th	15 18 44.01	10.256	—18 17 55.4	—38.92	16 12.24	8.90	+15 27.52	—0.399	15 34 11.53
16	Fr	15 22 50.56	10.290	—18 33 19.7	—38.10	16 12.46	8.90	+15 17.53	—0.434	15 38 8.09

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliquity.	Mean Time of Sidereal Noon.
		" ' "	"	"			"	"	"	23° 26' "	h m s
Oct. 1	274	187 16 47.7	147.51	-0.87	0.000 4265	-51.0	37.58	-6.54	20.44	48.96	11 21 21.43
2	275	188 15 49.2	147.61	0.84	0.000 3041	51.0	37.72	6.60	20.45	48.95	11 17 25.53
3	276	189 14 52.9	147.70	0.78	0.000 1817	51.0	37.86	6.65	20.46	48.95	11 13 29.62
4	277	190 13 59.0	147.80	0.69	0.000 0592	51.1	38.00	6.71	20.46	48.95	11 9 33.72
5	278	191 13 7.5	147.90	0.58	9.999 9364	51.2	38.13	6.77	20.47	48.94	11 5 37.81
6	279	192 12 18.2	148.00	-0.45	9.999 8133	-51.4	38.27	-6.82	20.47	48.93	11 1 41.90
7	280	193 11 31.3	148.09	0.31	9.999 6897	51.6	38.41	6.88	20.48	48.93	10 57 46.00
8	281	194 10 46.6	148.18	0.17	9.999 5657	51.8	38.55	6.93	20.48	48.92	10 53 50.09
9	282	195 10 4.1	148.27	-0.04	9.999 4412	52.0	38.68	6.99	20.49	48.91	10 49 54.18
10	283	196 9 23.7	148.36	+0.08	9.999 3160	52.2	38.82	7.04	20.50	48.90	10 45 58.28
11	284	197 8 45.3	148.44	+0.19	9.999 1904	-52.5	38.96	-7.09	20.50	48.90	10 42 2.37
12	285	198 8 8.9	148.52	0.27	9.999 0642	52.7	39.10	7.14	20.51	48.89	10 38 6.47
13	286	199 7 34.4	148.60	0.31	9.998 9376	52.8	39.24	7.19	20.51	48.88	10 34 10.56
14	287	200 7 1.7	148.67	0.32	9.998 8108	52.8	39.37	7.24	20.52	48.86	10 30 14.65
15	288	201 6 30.7	148.75	0.29	9.998 6840	52.8	39.51	7.29	20.53	48.85	10 26 18.75
16	289	202 6 1.5	148.82	+0.24	9.998 5572	-52.7	39.65	-7.34	20.53	48.84	10 22 22.84
17	290	203 5 34.0	148.89	0.16	9.998 4308	52.6	39.79	7.38	20.54	48.83	10 18 26.93
18	291	204 5 8.3	148.96	+0.06	9.998 3048	52.3	39.92	7.43	20.54	48.82	10 14 31.03
19	292	205 4 44.3	149.04	-0.06	9.998 1795	52.0	40.06	7.47	20.55	48.80	10 10 35.12
20	293	206 4 22.1	149.11	0.19	9.998 0550	51.7	40.20	7.51	20.56	48.79	10 6 39.21
21	294	207 4 1.7	149.19	-0.31	9.997 9314	-51.3	40.34	-7.55	20.56	48.78	10 2 43.31
22	295	208 3 43.1	149.27	0.43	9.997 8088	50.9	40.47	7.59	20.57	48.76	9 58 47.40
23	296	209 3 26.4	149.35	0.54	9.997 6873	50.4	40.61	7.63	20.57	48.75	9 54 51.49
24	297	210 3 11.7	149.43	0.63	9.997 5669	49.9	40.75	7.67	20.58	48.73	9 50 55.58
25	298	211 2 58.9	149.51	0.70	9.997 4477	49.4	40.89	7.71	20.58	48.72	9 46 59.68
26	299	212 2 48.1	149.59	-0.75	9.997 3298	-48.9	41.02	-7.74	20.59	48.70	9 43 3.77
27	300	213 2 39.4	149.68	0.77	9.997 2131	48.4	41.16	7.77	20.60	48.69	9 39 7.86
28	301	214 2 32.8	149.77	0.77	9.997 0976	47.9	41.30	7.81	20.60	48.67	9 35 11.96
29	302	215 2 28.2	149.85	0.74	9.996 9834	47.4	41.44	7.84	20.61	48.65	9 31 16.05
30	303	216 2 25.8	149.94	0.68	9.996 8703	46.9	41.57	7.86	20.61	48.64	9 27 20.14
31	304	217 2 25.5	150.03	-0.59	9.996 7584	-46.4	41.71	-7.89	20.62	48.62	9 23 24.23
Nov. 1	305	218 2 27.4	150.12	0.49	9.996 6476	46.0	41.85	7.92	20.62	48.60	9 19 28.32
2	306	219 2 31.4	150.21	0.37	9.996 5377	45.6	41.99	7.94	20.63	48.59	9 15 32.42
3	307	220 2 37.6	150.30	0.24	9.996 4288	45.2	42.13	7.96	20.63	48.57	9 11 36.51
4	308	221 2 46.0	150.39	-0.11	9.996 3207	44.9	42.26	7.98	20.64	48.55	9 7 40.60
5	309	222 2 56.4	150.48	+0.02	9.996 2133	-44.6	42.40	-8.00	20.64	48.54	9 3 44.69
6	310	223 3 8.9	150.56	0.15	9.996 1065	44.4	42.54	8.02	20.65	48.52	8 59 48.78
7	311	224 3 23.4	150.64	0.25	9.996 0003	44.2	42.68	8.04	20.65	48.50	8 55 52.87
8	312	225 3 39.7	150.72	0.33	9.995 8946	44.0	42.81	8.05	20.66	48.48	8 51 56.97
9	313	226 3 57.8	150.79	0.38	9.995 7893	43.8	42.95	8.06	20.66	48.46	8 48 1.06
10	314	227 4 17.6	150.86	+0.40	9.995 6846	-43.5	43.09	-8.07	20.67	48.45	8 44 5.15
11	315	228 4 38.9	150.92	0.39	9.995 5805	43.2	43.23	8.03	20.67	48.43	8 40 9.24
12	316	229 5 1.8	150.98	0.34	9.995 4772	42.9	43.36	8.03	20.68	48.41	8 36 13.33
13	317	230 5 26.0	151.04	0.26	9.995 3748	42.4	43.50	8.10	20.68	48.39	8 32 17.42
14	318	231 5 51.7	151.10	0.16	9.995 2736	41.9	43.64	8.10	20.69	48.38	8 28 21.51
15	319	232 6 18.6	151.15	+0.05	9.995 1736	-41.3	43.78	-8.10	20.69	48.36	8 24 25.60
16	320	233 6 46.9	151.21	-0.07	9.995 0751	-40.7	43.91	-8.11	20.70	48.34	8 20 29.69

FOR GREENWICH MEAN NOON.

Date.	Day of the Week.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Semi-diameter.	Hor. Par.	Equation of Time. App.—Mean.	Var. per Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ' "	"	' "	"	m s	s	h m s
Nov. 16	Fr	15 22 50.56	10.290	-18 33 19.7	-38.10	16 12.46	8.90	+15 17.53	-0.134	15 38 8.09
17	Sa	15 26 57.93	10.324	18 48 24.2	37.27	16 12.68	8.90	15 6.71	0.468	15 42 4.64
18	Su	15 31 6.12	10.359	19 3 8.6	36.13	16 12.89	8.90	14 55.08	0.502	15 46 1.20
19	Mo	15 35 15.14	10.393	19 17 32.5	35.57	16 13.10	8.91	14 42.62	0.536	15 49 57.76
20	Tu	15 39 24.96	10.426	19 31 35.6	34.69	16 13.31	8.91	14 29.35	0.570	15 53 54.31
21	We	15 43 35.60	10.460	-19 45 17.4	-33.80	16 13.51	8.91	+14 15.27	-0.601	15 57 50.87
22	Th	15 47 47.04	10.493	19 58 37.7	32.89	16 13.70	8.91	14 0.38	0.637	16 1 47.42
23	Fr	15 51 59.27	10.526	20 11 36.0	31.97	16 13.89	8.91	13 44.70	0.670	16 5 43.98
24	Sa	15 56 12.30	10.559	20 24 12.0	31.03	16 14.08	8.92	13 28.24	0.702	16 9 40.53
25	Su	16 0 26.10	10.591	20 36 25.4	30.08	16 14.26	8.92	13 10.99	0.735	16 13 37.09
26	Mo	16 4 40.68	10.623	-20 48 15.9	-29.12	16 14.44	8.92	+12 52.97	-0.767	16 17 33.65
27	Tu	16 8 56.02	10.655	20 59 43.0	28.14	16 14.61	8.92	12 34.19	0.798	16 21 30.20
28	We	16 13 12.10	10.686	21 10 46.6	27.15	16 14.78	8.92	12 14.66	0.829	16 25 26.76
29	Th	16 17 28.92	10.716	21 21 26.2	26.15	16 14.94	8.92	11 54.40	0.859	16 29 23.32
30	Fr	16 21 46.45	10.745	21 31 41.6	25.13	16 15.09	8.92	11 33.42	0.889	16 33 19.87
Dec. 1	Sa	16 26 4.69	10.771	-21 41 32.5	-24.11	16 15.25	8.93	+11 11.74	-0.918	16 37 16.43
2	Su	16 30 23.60	10.802	21 50 58.6	23.07	16 15.40	8.93	10 49.38	0.946	16 41 12.98
3	Mo	16 34 43.18	10.829	21 59 59.6	22.01	16 15.55	8.93	10 26.36	0.973	16 45 9.54
4	Tu	16 39 3.39	10.855	22 8 35.2	20.95	16 15.69	8.93	10 2.70	0.999	16 49 6.10
5	We	16 43 24.22	10.880	22 16 45.2	19.88	16 15.83	8.93	9 38.43	1.023	16 53 2.66
6	Th	16 47 45.63	10.904	-22 24 29.3	-18.79	16 15.96	8.93	+ 9 13.58	-1.017	16 56 59.21
7	Fr	16 52 7.60	10.926	22 31 47.2	17.70	16 16.09	8.93	8 48.17	1.070	17 0 55.77
8	Sa	16 56 30.08	10.947	22 38 38.7	16.59	16 16.22	8.93	8 22.25	1.091	17 4 52.33
9	Su	17 0 53.05	10.967	22 45 3.6	15.18	16 16.34	8.94	7 55.83	1.110	17 8 48.88
10	Mo	17 5 16.48	10.985	22 51 1.7	14.36	16 16.46	8.94	7 28.96	1.128	17 12 45.44
11	Tu	17 9 40.33	11.002	-22 56 32.7	-13.23	16 16.58	8.94	+ 7 1.67	-1.145	17 16 42.00
12	We	17 14 4.57	11.018	23 1 36.5	12.09	16 16.70	8.94	6 33.99	1.161	17 20 38.55
13	Th	17 18 29.16	11.032	23 6 12.9	10.94	16 16.81	8.94	6 5.95	1.175	17 24 35.11
14	Fr	17 22 54.08	11.045	23 10 21.7	9.79	16 16.92	8.94	+5 37.59	1.188	17 28 31.67
15	Sa	17 27 19.29	11.056	23 14 2.9	8.64	16 17.02	8.94	5 8.94	1.199	17 32 28.23
16	Su	17 31 44.76	11.066	-23 17 16.2	- 7.17	16 17.12	8.94	+ 4 40.03	-1.210	17 36 24.78
17	Mo	17 36 10.45	11.075	23 20 1.6	6.31	16 17.21	8.94	4 10.89	1.219	17 40 21.34
18	Tu	17 40 36.34	11.083	23 22 18.9	5.14	16 17.30	8.94	3 41.55	1.226	17 44 17.90
19	We	17 45 2.40	11.089	23 24 8.1	3.97	16 17.38	8.95	3 12.05	1.232	17 48 14.46
20	Th	17 49 28.60	11.094	23 25 29.2	2.79	16 17.45	8.95	2 42.42	1.237	17 52 11.01
21	Fr	17 53 54.90	11.097	-23 26 22.0	- 1.61	16 17.52	8.95	+ 2 12.68	-1.241	17 56 7.57
22	Sa	17 58 21.26	11.100	23 26 46.6	- 0.44	16 17.59	8.95	1 42.87	1.243	18 0 4.13
23	Su	18 2 47.67	11.101	23 26 42.9	+ 0.74	16 17.64	8.95	1 13.02	1.244	18 4 0.69
24	Mo	18 7 14.09	11.101	23 26 10.9	1.92	16 17.69	8.95	0 43.15	1.244	18 7 57.24
25	Tu	18 11 40.49	11.099	23 25 10.6	3.10	16 17.74	8.95	+ 0 13.31	1.242	18 11 53.80
26	We	18 16 6.84	11.096	-23 23 42.1	+ 4.28	16 17.78	8.95	- 0 16.48	-1.240	18 15 50.36
27	Th	18 20 33.10	11.092	23 21 45.3	5.45	16 17.81	8.95	0 46.19	1.236	18 19 46.92
28	Fr	18 24 59.26	11.087	23 19 20.4	6.62	16 17.84	8.95	1 15.79	1.230	18 23 43.47
29	Sa	18 29 25.27	11.081	23 16 27.4	7.79	16 17.86	8.95	1 45.24	1.224	18 27 40.03
30	Su	18 33 51.12	11.073	23 13 6.4	8.96	16 17.87	8.95	2 14.53	1.216	18 31 36.59
31	Mo	18 38 16.75	11.063	-23 9 17.4	+10.12	16 17.88	8.95	- 2 43.61	-1.207	18 35 33.14
32	Tu	18 42 42.15	11.053	-23 5 0.7	+11.28	16 17.89	8.95	- 3 12.45	-1.196	18 39 29.70

FOR GREENWICH MEAN NOON.

Date.	Day of the Year.	True Longitude.	Var. per Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Var. per Hour.	Prec. in Long.	Nut. in Long.	Aber-ration.	True Obliq-uity.	Mean Time of Sidereal Noon.
		° ' "	"	"			"	"	"	23° 26'	h m s
Nov. 16	320	233 6 46.9	151.21	-0.07	9.995 0751	-40.7	43.91	-8.11	20.70	48.34	8 20 29.69
17	321	234 7 16.5	151.26	0.19	9.994 9782	40.0	44.05	8.11	20.70	48.32	8 16 33.78
18	322	235 7 47.4	151.32	0.31	9.994 8830	39.3	44.19	8.10	20.71	48.31	8 12 37.87
19	323	236 8 19.7	151.37	0.42	9.994 7896	38.5	44.33	8.10	20.71	48.29	8 8 41.96
20	324	237 8 53.2	151.43	0.51	9.994 6982	37.7	44.46	8.09	20.72	48.28	8 4 46.05
21	325	238 9 28.2	151.48	-0.58	9.994 6088	-36.8	44.60	-8.09	20.72	48.26	8 0 50.14
22	326	239 10 4.4	151.54	0.63	9.994 5215	35.9	44.74	8.08	20.72	48.24	7 56 54.24
23	327	240 10 42.1	151.60	0.65	9.994 4364	35.0	44.88	8.07	20.73	48.23	7 52 58.33
24	328	241 11 21.2	151.66	0.65	9.994 3535	34.1	45.02	8.06	20.73	48.21	7 49 2.42
25	329	242 12 1.7	151.72	0.62	9.994 2728	33.1	45.15	8.05	20.74	48.20	7 45 6.50
26	330	243 12 43.7	151.78	-0.57	9.994 1944	-32.2	45.29	-8.03	20.74	48.19	7 41 10.59
27	331	244 13 27.1	151.84	0.49	9.994 1182	31.3	45.43	8.02	20.74	48.17	7 37 14.68
28	332	245 14 12.0	151.90	0.39	9.994 0441	30.4	45.57	8.00	20.75	48.16	7 33 18.77
29	333	246 14 58.4	151.96	0.27	9.993 9722	29.5	45.70	7.98	20.75	48.15	7 29 22.86
30	334	247 15 46.3	152.03	-0.14	9.993 9023	28.7	45.84	7.97	20.75	48.14	7 25 26.95
Dec. 1	335	248 16 35.7	152.09	0.00	9.993 8345	-27.9	45.98	-7.95	20.76	48.12	7 21 31.04
2	336	249 17 26.6	152.15	+0.13	9.993 7685	27.1	46.12	7.92	20.76	48.11	7 17 35.13
3	337	250 18 19.0	152.21	0.26	9.993 7042	26.5	46.25	7.90	20.76	48.10	7 13 39.22
4	338	251 19 12.7	152.26	0.37	9.993 6415	25.8	46.39	7.88	20.77	48.09	7 9 43.31
5	339	252 20 7.7	152.32	0.45	9.993 5803	25.2	46.53	7.86	20.77	48.08	7 5 47.40
6	340	253 21 4.1	152.37	+0.50	9.993 5205	-24.6	46.67	-7.83	20.77	48.07	7 1 51.49
7	341	254 22 1.5	152.41	0.52	9.993 4621	24.1	46.80	7.80	20.77	48.06	6 57 55.58
8	342	255 23 0.0	152.46	0.50	9.993 4050	23.5	46.94	7.78	20.78	48.06	6 53 59.67
9	343	256 23 59.4	152.49	0.46	9.993 3492	23.0	47.08	7.75	20.78	48.05	6 50 3.75
10	344	257 24 59.6	152.52	0.39	9.993 2948	22.4	47.22	7.72	20.78	48.04	6 46 7.84
11	345	258 26 0.5	152.55	+0.29	9.993 2419	-21.7	47.35	-7.69	20.79	48.04	6 42 11.93
12	346	259 27 2.0	152.57	0.18	9.993 1906	21.0	47.49	7.66	20.79	48.03	6 38 16.02
13	347	260 28 4.1	152.60	+0.05	9.993 1411	20.2	47.63	7.63	20.79	48.03	6 34 20.11
14	348	261 29 6.7	152.62	-0.08	9.993 0935	19.4	47.77	7.60	20.79	48.02	6 30 24.20
15	349	262 30 9.7	152.63	0.19	9.993 0479	18.5	47.90	7.57	20.79	48.02	6 26 28.29
16	350	263 31 13.1	152.65	-0.29	9.993 0046	-17.6	48.04	-7.53	20.80	48.02	6 22 32.37
17	351	264 32 17.0	152.67	0.39	9.992 9635	16.6	48.18	7.50	20.80	48.02	6 18 36.46
18	352	265 33 21.2	152.68	0.46	9.992 9248	15.6	48.32	7.47	20.80	48.02	6 14 40.55
19	353	266 34 25.8	152.70	0.51	9.992 8887	14.5	48.46	7.44	20.80	48.02	6 10 44.64
20	354	267 35 30.9	152.72	0.53	9.992 8551	13.4	48.59	7.40	20.80	48.02	6 6 48.73
21	355	268 36 36.3	152.73	-0.53	9.992 8242	-12.3	48.73	-7.37	20.81	48.02	6 2 52.82
22	356	269 37 42.1	152.75	0.50	9.992 7960	11.2	48.87	7.34	20.81	48.02	5 58 56.91
23	357	270 38 48.3	152.77	0.45	9.992 7706	10.0	49.01	7.30	20.81	48.02	5 55 0.99
24	358	271 39 54.9	152.78	0.37	9.992 7480	8.9	49.14	7.27	20.81	48.03	5 51 5.08
25	359	272 41 1.9	152.80	0.27	9.992 7281	7.7	49.28	7.23	20.81	48.03	5 47 9.17
26	360	273 42 9.4	152.82	-0.14	9.992 7110	-6.5	49.42	-7.20	20.81	48.03	5 43 13.26
27	361	274 43 17.4	152.84	-0.01	9.992 6967	5.4	49.56	7.17	20.81	48.04	5 39 17.35
28	362	275 44 25.8	152.86	+0.13	9.992 6850	4.3	49.69	7.14	20.81	48.05	5 35 21.44
29	363	276 45 34.7	152.88	0.27	9.992 6759	3.3	49.83	7.10	20.81	48.05	5 31 25.52
30	364	277 46 44.1	152.90	0.40	9.992 6692	2.3	49.97	7.07	20.81	48.06	5 27 29.61
31	365	278 47 53.9	152.92	+0.50	9.992 6648	-1.4	50.11	-7.04	20.81	48.07	5 23 33.70
32	366	279 49 4.2	152.94	+0.58	9.992 6626	-0.5	50.24	-7.01	20.81	48.08	5 19 37.79

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Jan. 1	+0.171 9264	+0.180 5272	+ 60	-0.888 1505	-0.886 7093	+193	-0.385 1962	-0.384 5711	-417
2	0.189 1140	0.197 6861	52	0.885 1994	0.883 6210	191	0.383 9162	0.383 2315	416
3	0.206 2429	0.214 7838	44	0.881 9742	0.880 2592	190	0.382 5172	0.381 7732	414
4	0.223 3081	0.231 8152	36	0.878 4760	0.876 6248	188	0.380 9997	0.380 1966	412
5	0.240 3046	0.248 7756	29	0.874 7056	0.872 7187	186	0.379 3641	0.378 5021	411
6	+0.257 2276	+0.265 6599	+ 21	-0.870 6641	-0.868 5420	+184	-0.377 6107	-0.376 6900	-409
7	0.274 0720	0.282 4631	13	0.866 3524	0.864 0955	181	0.375 7401	0.374 7610	407
8	0.290 8327	0.299 1801	+ 6	0.861 7715	0.859 3804	178	0.373 7527	0.372 7153	405
9	0.307 5046	0.315 8057	- 1	0.856 9224	0.854 3977	174	0.371 6490	0.370 5537	403
10	0.324 0826	0.332 3347	9	0.851 8064	0.849 1486	171	0.369 4296	0.368 2767	401
11	+0.340 5613	+0.348 7618	- 16	-0.846 4246	-0.843 6345	+167	-0.367 0950	-0.365 8847	-399
12	0.356 9354	0.365 0815	23	0.840 7784	0.837 8566	163	0.364 6458	0.363 3785	397
13	0.373 1995	0.381 2886	29	0.834 8693	0.831 8167	158	0.362 0828	0.360 7588	395
14	0.389 3482	0.397 3776	36	0.828 6991	0.825 5166	154	0.359 4067	0.358 0265	393
15	0.405 3761	0.413 3431	43	0.822 2695	0.818 9581	149	0.356 6183	0.355 1823	391
16	+0.421 2778	+0.429 1797	- 49	-0.815 5827	-0.812 1435	+144	-0.353 7185	-0.352 2271	-389
17	0.437 0481	0.444 8823	55	0.808 6409	0.805 0751	138	0.350 7082	0.349 1620	387
18	0.452 6817	0.460 4457	61	0.801 4465	0.797 7553	132	0.347 5885	0.345 9879	384
19	0.468 1736	0.475 8648	66	0.794 0020	0.790 1868	126	0.344 3604	0.342 7061	382
20	0.483 5187	0.491 1347	72	0.786 3100	0.782 3721	120	0.341 0251	0.339 3176	379
21	+0.498 7122	+0.506 2506	- 77	-0.778 3734	-0.774 3142	+114	-0.337 5837	-0.335 8235	-377
22	0.513 7494	0.521 2080	82	0.770 1949	0.766 0158	108	0.334 0373	0.332 2252	375
23	0.528 6257	0.536 0021	87	0.761 7774	0.757 4800	101	0.330 3873	0.328 5238	372
24	0.543 3366	0.550 6286	92	0.753 1239	0.748 7096	94	0.326 6348	0.324 7206	369
25	0.557 8776	0.565 0830	96	0.744 2374	0.739 7077	87	0.322 7813	0.320 8170	367
26	+0.572 2444	+0.579 3612	-101	-0.735 1210	-0.730 4776	+ 80	-0.318 8280	-0.316 8143	-364
27	0.586 4328	0.593 4588	105	0.725 7778	0.721 0221	72	0.314 7761	0.312 7136	362
28	0.600 4387	0.607 3720	108	0.716 2110	0.711 3448	65	0.310 6271	0.308 5166	359
29	0.614 2582	0.621 0969	112	0.706 4239	0.701 4487	57	0.306 3824	0.304 2246	356
30	0.627 8875	0.634 6296	115	0.696 4196	0.691 3370	49	0.302 0433	0.299 8388	353
31	+0.641 3228	+0.647 9665	-118	-0.686 2013	-0.681 0129	+ 41	-0.297 6113	-0.295 3609	-350
Feb. 1	0.654 5604	0.661 1039	121	0.675 7722	0.670 4796	33	0.293 0878	0.290 7921	347
2	0.667 5966	0.674 0381	124	0.665 1354	0.659 7401	25	0.288 4740	0.286 1337	344
3	0.680 4279	0.686 7655	126	0.654 2940	0.648 7975	17	0.283 7714	0.281 3872	341
4	0.693 0506	0.699 2827	128	0.643 2509	0.637 6548	+ 9	0.278 9813	0.276 5539	338
5	+0.705 4612	+0.711 5857	-130	-0.632 0094	-0.626 3152	0	-0.274 1051	-0.271 6352	-335
6	0.717 6557	0.723 6708	132	0.620 5726	0.614 7819	- 8	0.269 1444	0.266 6327	332
7	0.729 6304	0.735 5341	133	0.608 9437	0.603 0583	17	0.264 1003	0.261 5475	329
8	0.741 3815	0.747 1720	134	0.597 1261	0.591 1476	25	0.258 9745	0.256 3814	326
9	0.752 9052	0.758 5806	135	0.585 1232	0.579 0533	34	0.253 7685	0.251 1359	322
10	+0.764 1978	+0.769 7562	-136	-0.572 9385	-0.566 7792	- 43	-0.248 4839	-0.245 8126	-319
11	0.775 2555	0.780 6951	136	0.560 5759	0.554 3291	51	0.243 1222	0.240 4130	316
12	0.786 0747	0.791 3937	136	0.548 0393	0.541 7070	60	0.237 6852	0.234 9390	312
13	0.796 6517	0.801 8484	136	0.535 3327	0.528 9169	69	0.232 1746	0.229 3923	309
14	0.806 9832	0.812 0558	136	0.522 4602	0.515 9631	78	0.226 5922	0.223 7746	305
15	+0.817 0658	+0.822 0128	-136	-0.509 4261	-0.502 8498	- 86	-0.220 9398	-0.218 0879	-302
16	+0.826 8964	+0.831 7163	-135	-0.496 2347	-0.489 5814	- 95	-0.215 2193	-0.212 3341	-298

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Feb. 16	+0.826 8964	+0.831 7163	-135	-0.496 2347	-0.489 5814	- 95	-0.215 2193	-0.212 3341	-298
17	0.836 4720	0.841 1633	134	0.482 8905	0.476 1625	104	0.209 4325	0.206 5149	295
18	0.845 7897	0.850 3509	133	0.469 3980	0.462 5975	113	0.203 5814	0.200 6324	291
19	0.854 8467	0.859 2767	131	0.455 7617	0.448 8910	121	0.197 6680	0.194 6884	287
20	0.863 6406	0.867 9381	129	0.441 9860	0.435 0474	130	0.191 6940	0.188 6849	283
21	+0.872 1689	+0.876 3327	-128	-0.428 0757	-0.421 0715	-139	-0.185 6615	-0.182 6239	-280
22	0.880 4292	0.884 4582	126	0.414 0353	0.406 9677	147	0.179 5725	0.176 5074	276
23	0.888 4195	0.892 3127	123	0.399 8693	0.392 7408	156	0.173 4289	0.170 3373	272
24	0.896 1377	0.899 8941	121	0.385 5826	0.378 3953	165	0.167 2329	0.164 1158	268
25	0.903 5818	0.907 2006	118	0.371 1796	0.363 9359	173	0.160 9862	0.157 8445	264
26	+0.910 7503	+0.914 2306	-115	-0.356 6649	-0.349 3671	-182	-0.154 6909	-0.151 5256	-260
27	0.917 6413	0.920 9824	112	0.342 0431	0.334 6934	190	0.148 3490	0.145 1612	256
28	0.924 2535	0.927 4545	109	0.327 3187	0.319 9194	198	0.141 9625	0.138 7531	252
Mar. 1	0.930 5853	0.933 6457	106	0.312 4961	0.305 0493	207	0.135 5332	0.132 3031	248
2	0.936 6356	0.939 5547	102	0.297 5795	0.290 0873	215	0.129 0631	0.125 8134	243
3	+0.942 4029	+0.945 1800	- 98	-0.282 5733	-0.275 0379	-223	-0.122 5541	-0.119 2856	-239
4	0.947 8858	0.950 5202	94	0.267 4817	0.259 9052	231	0.116 0080	0.112 7216	235
5	0.953 0830	0.955 5740	90	0.252 3089	0.244 6934	239	0.109 4267	0.106 1234	231
6	0.957 9930	0.960 3398	85	0.237 0591	0.229 4066	247	0.102 8121	0.099 4929	226
7	0.962 6143	0.964 8162	81	0.221 7365	0.214 0493	255	0.096 1660	0.092 8318	222
8	+0.966 9455	+0.969 0019	- 76	-0.206 3455	-0.198 6258	-262	-0.089 4905	-0.086 1423	-217
9	0.970 9852	0.972 8952	71	0.190 8908	0.183 1409	270	0.082 7874	0.079 4262	213
10	0.974 7318	0.976 4949	66	0.175 3768	0.167 5990	278	0.076 0588	0.072 6856	208
11	0.978 1842	0.979 7997	61	0.159 8082	0.152 0050	285	0.069 3067	0.065 9225	204
12	0.981 3412	0.982 8086	56	0.144 1899	0.136 3636	292	0.062 5332	0.059 1390	199
13	+0.984 2018	+0.985 5206	- 50	-0.128 5267	-0.120 6798	-300	-0.055 7403	-0.052 3373	-194
14	0.986 7649	0.987 9347	45	0.112 8236	0.104 9587	307	0.048 9303	0.045 5195	190
15	0.989 0299	0.990 0504	39	0.097 0856	0.089 2051	314	0.042 1052	0.038 6877	185
16	0.990 9962	0.991 8672	33	0.081 3177	0.073 4241	321	0.035 2672	0.031 8440	180
17	0.992 6633	0.993 3846	27	0.065 5250	0.057 6209	328	0.028 4184	0.024 9906	175
18	+0.994 0310	+0.994 6024	- 20	-0.049 7125	-0.041 8004	-334	-0.021 5610	-0.018 1298	-170
19	0.995 0990	0.995 5207	14	0.033 8853	0.025 9677	341	0.014 6972	0.011 2636	165
20	0.995 8675	0.996 1394	8	0.018 0484	-0.010 1279	348	0.007 8292	-0.004 3942	160
21	0.996 3365	0.996 4588	- 1	-0.002 2068	+0.005 7142	354	-0.000 9590	+0.002 4762	155
22	0.996 5063	0.996 4791	+ 6	+0.013 6345	0.021 5535	360	+0.005 9112	0.009 3456	150
23	+0.996 3773	+0.996 2009	+ 13	+0.029 4706	+0.037 3851	-367	+0.012 7792	+0.016 2118	-145
24	0.995 9501	0.995 6248	20	0.045 2965	0.053 2042	373	0.019 6431	0.023 0728	140
25	0.995 2253	0.994 7516	27	0.061 1075	0.069 0059	379	0.026 5006	0.029 9263	135
26	0.994 2038	0.993 5821	34	0.076 8987	0.084 7854	385	0.033 3496	0.036 7703	130
27	0.992 8865	0.992 1172	41	0.092 6655	0.100 5383	391	0.040 1882	0.043 6029	124
28	+0.991 2744	+0.990 3582	+ 49	+0.108 4032	+0.116 2598	-396	+0.047 0143	+0.050 4221	-119
29	0.989 3687	0.988 3061	57	0.124 1074	0.131 9456	402	0.053 8260	0.057 2259	113
30	0.987 1705	0.985 9620	64	0.139 7738	0.147 5915	407	0.060 6215	0.064 0124	108
31	0.984 6808	0.983 3271	72	0.155 3982	0.163 1933	413	0.067 3986	0.070 7798	103
Apr. 1	0.981 9009	0.980 4024	80	0.170 9764	0.178 7468	418	0.074 1557	0.077 5261	97
2	+0.978 8318	+0.977 1891	+ 88	+0.186 5042	+0.194 2480	-423	+0.080 8909	+0.084 2498	- 92
3	+0.975 4745	+0.973 6881	+ 96	+0.201 9776	+0.209 6926	-428	+0.087 6025	+0.090 9498	- 86

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Apr. 1	+0.981 9009	+0.980 4024	+ 80	+0.170 9764	+0.178 7468	-418	+0.074 1557	+0.077 5261	- 97
2	0.978 8318	0.977 1891	88	0.186 5042	0.194 2480	423	0.080 8909	0.084 2498	92
3	0.975 4745	0.973 6881	96	0.201 9776	0.209 6926	428	0.087 6025	0.090 9488	86
4	0.971 8300	0.969 9003	105	0.217 3924	0.225 0765	433	0.094 2884	0.097 6212	80
5	0.967 8991	0.965 8266	113	0.232 7443	0.240 3953	438	0.100 9469	0.104 2653	75
6	+0.963 6829	+0.961 4682	+122	+0.248 0290	+0.255 6448	-443	+0.107 5762	+0.110 8792	- 69
7	0.959 1825	0.956 8261	130	0.263 2422	0.270 8206	447	0.114 1742	0.117 4609	63
8	0.954 3991	0.951 9016	139	0.278 3794	0.285 9181	451	0.120 7391	0.124 0085	57
9	0.949 3339	0.946 6961	148	0.293 4361	0.300 9328	456	0.127 2689	0.130 5200	52
10	0.943 9884	0.941 2110	157	0.308 4077	0.315 8601	460	0.133 7616	0.136 9935	46
11	+0.938 3642	+0.935 4481	+166	+0.323 2895	+0.330 6954	-464	+0.140 2154	+0.143 4270	- 40
12	0.932 4630	0.929 4090	175	0.338 0771	0.345 4341	468	0.146 6282	0.149 8187	34
13	0.926 2865	0.923 0957	184	0.352 7659	0.360 0719	472	0.152 9982	0.156 1665	28
14	0.919 8369	0.916 5103	194	0.367 3515	0.374 6042	475	0.159 3234	0.162 4686	22
15	0.913 1162	0.909 6549	203	0.381 8293	0.389 0264	479	0.165 6018	0.168 7229	16
16	+0.906 1267	+0.902 5319	+213	+0.396 1949	+0.403 3342	-482	+0.171 8317	+0.174 9278	- 10
17	0.898 8708	0.895 1437	222	0.410 4439	0.417 5234	486	0.178 0111	0.181 0813	- 4
18	0.891 3509	0.887 4928	232	0.424 5721	0.431 5895	489	0.184 1382	0.187 1815	+ 2
19	0.883 5698	0.879 5821	242	0.438 5751	0.445 5284	491	0.190 2111	0.193 2267	9
20	0.875 5301	0.871 4142	252	0.452 4488	0.459 3359	494	0.196 2281	0.199 2151	15
21	+0.867 2347	+0.862 9920	+262	+0.466 1892	+0.473 0081	-497	+0.202 1875	+0.205 1450	+ 21
22	0.858 6865	0.854 3185	272	0.479 7922	0.486 5410	499	0.208 0874	0.211 0145	27
23	0.849 8885	0.845 3968	283	0.493 2540	0.499 9308	502	0.213 9262	0.216 8222	33
24	0.840 8439	0.836 2301	293	0.506 5709	0.513 1739	504	0.219 7023	0.222 5663	40
25	0.831 5559	0.826 8216	304	0.519 7393	0.526 2667	506	0.225 4141	0.228 2454	46
26	+0.822 0277	+0.817 1745	+314	+0.532 7556	+0.539 2057	-508	+0.231 0600	+0.233 8578	+ 53
27	0.812 2625	0.807 2920	325	0.545 6166	0.551 9878	509	0.236 6386	0.239 4022	59
28	0.802 2635	0.797 1773	336	0.558 3190	0.564 6098	511	0.242 1484	0.244 8771	65
29	0.792 0338	0.786 8334	347	0.570 8598	0.577 0686	512	0.247 5880	0.250 2811	72
30	0.781 5765	0.776 2634	358	0.583 2358	0.589 3611	513	0.252 9561	0.255 6129	78
May 1	+0.770 8946	+0.765 4703	+369	+0.595 4441	+0.601 4844	-514	+0.258 2514	+0.260 8713	+ 85
2	0.759 9910	0.754 4570	380	0.607 4816	0.613 4352	514	0.263 4724	0.266 0546	91
3	0.748 8687	0.743 2264	391	0.619 3450	0.625 2105	515	0.268 6177	0.271 1616	98
4	0.737 5305	0.731 7814	402	0.631 0314	0.636 8072	515	0.273 6860	0.276 1909	105
5	0.725 9794	0.720 1250	413	0.642 5375	0.648 2218	515	0.278 6760	0.281 1411	111
6	+0.714 2186	+0.708 2605	+425	+0.653 8598	+0.659 4510	-515	+0.283 5861	+0.286 0108	+118
7	0.702 2512	0.696 1910	436	0.664 9951	0.670 4916	515	0.288 4150	0.290 7986	124
8	0.690 0805	0.683 9200	448	0.675 9401	0.681 3402	514	0.293 1613	0.295 5030	131
9	0.677 7100	0.671 4510	460	0.686 6915	0.691 9936	513	0.297 8236	0.300 1228	138
10	0.665 1433	0.658 7875	471	0.697 2460	0.702 4484	512	0.302 4004	0.304 6563	144
11	+0.652 3841	+0.645 9334	+483	+0.707 6005	+0.712 7017	-511	+0.306 8904	+0.309 1025	+151
12	0.639 4361	0.632 8926	495	0.717 7518	0.722 7503	509	0.311 2924	0.313 4600	158
13	0.626 3033	0.619 6688	507	0.727 6969	0.732 5912	507	0.315 6050	0.317 7274	165
14	0.612 9896	0.606 2662	519	0.737 4328	0.742 2214	505	0.319 8269	0.321 9035	171
15	0.599 4991	0.592 6889	530	0.746 9566	0.751 6381	503	0.323 9570	0.325 9872	178
16	+0.585 8360	+0.578 9410	+542	+0.756 2655	+0.760 8385	-500	+0.327 9940	+0.329 9771	+185
17	+0.572 0045	+0.565 0269	+554	+0.765 3568	+0.769 8200	-497	+0.331 9366	+0.333 8723	+192

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
May 17	+0.572 0045	+0.565 0269	+ 554	+0.765 3568	+0.769 8200	-497	+0.331 9366	+0.333 8723	+192
18	0.558 0089	0.550 9510	566	0.774 2279	0.778 5800	494	0.335 7840	0.337 6716	198
19	0.543 8538	0.536 7178	578	0.782 8762	0.787 1161	491	0.339 5350	0.341 3739	205
20	0.529 5436	0.522 3317	590	0.791 2994	0.795 4259	487	0.343 1884	0.344 9783	212
21	0.515 0827	0.507 7973	603	0.799 4953	0.803 5074	483	0.346 7434	0.348 4837	219
22	+0.500 4759	+0.493 1192	+615	+0.807 4619	+0.811 3586	-479	+0.350 1991	+0.351 8894	+226
23	0.485 7276	0.478 3018	627	0.815 1972	0.818 9775	474	0.353 5545	0.355 1943	233
24	0.470 8423	0.463 3497	639	0.822 6993	0.826 3624	469	0.356 8088	0.358 3978	239
25	0.455 8246	0.448 2675	651	0.829 9667	0.833 5119	464	0.359 9613	0.361 4992	246
26	0.440 6790	0.433 0596	663	0.836 9978	0.840 4243	458	0.363 0113	0.364 4977	253
27	+0.425 4098	+0.417 7302	+ 675	+0.843 7912	+0.847 0983	-453	+0.365 9582	+0.367 3928	+260
28	0.410 0212	0.402 2834	686	0.850 3454	0.853 5324	446	0.368 8013	0.370 1837	266
29	0.394 5174	0.386 7236	698	0.856 6591	0.859 7254	440	0.371 5398	0.372 8697	273
30	0.378 9026	0.371 0548	710	0.862 7310	0.865 6758	433	0.374 1732	0.375 4503	280
31	0.363 1807	0.355 2809	722	0.868 5595	0.871 3820	426	0.376 7010	0.377 9250	287
June 1	+0.347 3558	+0.339 4060	+ 733	+0.874 1431	+0.876 8426	-419	+0.379 1224	+0.380 2930	+294
2	0.331 4321	0.323 4344	745	0.879 4804	0.882 0562	411	0.381 4368	0.382 5536	300
3	0.315 4136	0.307 3702	757	0.884 5698	0.887 0210	403	0.383 6435	0.384 7063	307
4	0.299 3047	0.291 2177	768	0.889 4097	0.891 7356	395	0.385 7419	0.386 7504	314
5	0.283 1098	0.274 9815	779	0.893 9985	0.896 1983	386	0.387 7315	0.388 6852	321
6	+0.266 8333	+0.258 6659	+ 790	+0.898 3347	+0.900 4076	-377	+0.389 6114	+0.390 5101	+327
7	0.250 4798	0.242 2756	801	0.902 4169	0.904 3624	367	0.391 3812	0.392 2246	334
8	0.234 0539	0.225 8153	812	0.906 2139	0.908 0612	358	0.393 0402	0.393 8281	341
9	0.217 5603	0.209 2897	823	0.909 8142	0.911 5027	348	0.394 5881	0.395 3201	347
10	0.201 0039	0.192 7036	834	0.913 1267	0.914 6859	337	0.396 0242	0.396 7003	354
11	+0.184 3895	+0.176 0620	+ 844	+0.916 1803	+0.917 6097	-326	+0.397 3482	+0.397 9679	+361
12	0.167 7219	0.159 3697	855	0.918 9741	0.920 2732	315	0.398 5595	0.399 1228	367
13	0.151 0061	0.142 6317	865	0.921 5071	0.922 6755	304	0.399 6579	0.400 1646	373
14	0.134 2471	0.125 8530	875	0.923 7785	0.924 8158	292	0.400 6429	0.401 0929	380
15	0.117 4500	0.109 0387	884	0.925 7875	0.926 6935	280	0.401 5144	0.401 9075	387
16	+0.100 6198	+0.092 1940	+ 894	+0.927 5338	+0.928 3083	-267	+0.402 2721	+0.402 6082	+393
17	0.083 7618	0.075 3239	903	0.929 0169	0.929 6596	255	0.402 9157	0.403 1947	399
18	0.066 8810	0.058 4336	913	0.930 2365	0.930 7475	242	0.403 4452	0.403 6671	406
19	0.049 9825	0.041 5282	921	0.931 1927	0.931 5720	228	0.403 8605	0.404 0254	412
20	0.033 0713	0.024 6125	930	0.931 8855	0.932 1332	214	0.404 1617	0.404 2695	418
21	+0.016 1524	+0.007 6916	+ 938	+0.932 3151	+0.932 4312	-200	+0.404 3487	+0.404 3994	+425
22	-0.000 7693	-0.009 2297	947	0.932 4817	0.932 4665	186	0.404 4216	0.404 4153	431
23	0.017 6890	0.026 1467	955	0.932 3857	0.932 2394	172	0.404 3806	0.404 3174	437
24	0.034 6021	0.043 0548	962	0.932 0276	0.931 7505	157	0.404 2258	0.404 1058	443
25	0.051 5041	0.059 9495	969	0.931 4081	0.931 0004	141	0.403 9575	0.403 7808	449
26	-0.068 3904	-0.076 8263	+ 976	+0.930 5275	+0.929 9895	-126	+0.403 5758	+0.403 3424	+455
27	0.055 2567	0.093 6810	983	0.929 3864	0.928 7182	110	0.403 0808	0.402 7910	461
28	0.102 0987	0.110 5092	990	0.927 9851	0.927 1871	94	0.402 4729	0.402 1266	467
29	0.118 9120	0.127 3066	996	0.926 3242	0.925 3965	78	0.401 7522	0.401 3497	473
30	0.135 6924	0.144 0689	1001	0.924 4040	0.923 3467	61	0.400 9190	0.400 4602	479
July 1	-0.152 4356	-0.160 7918	+1007	+0.922 2248	+0.921 0382	- 44	+0.399 9734	+0.399 4585	+485
2	-0.169 1370	-0.177 4706	+1012	+0.919 7870	+0.918 4712	- 27	+0.398 9155	+0.398 3445	+490

GREENWICH MEAN TIME.

Date.	X		Reduce.	Y			Reduce.	Z		Reduce.
	True Equinox.		to Mean	True Equinox.			to Mean	True Equinox.		to Mean
	Noon.	Midnight.	Eq'x of 1923.0.	Noon.	Midnight.	Noon.	Eq'x of 1923.0.	Noon.	Midnight.	Eq'x of 1923.0.
July	1	-0.152 4356	-0.160 7918	+1007	+0.922 2248	+0.921 0382	- 44	+0.399 9734	+0.399 4585	+485
	2	0.169 1370	0.177 4706	1012	0.919 7870	0.918 4712	27	0.398 9155	0.398 3445	490
	3	0.185 7921	0.194 1009	1017	0.917 0909	0.915 6462	- 9	0.397 7456	0.397 1187	496
	4	0.202 3965	0.210 6781	1021	0.914 1371	0.912 5637	+ 8	0.396 4639	0.395 7812	502
	5	0.218 9453	0.227 1975	1025	0.910 9261	0.909 2243	26	0.395 0706	0.394 3322	507
	6	-0.235 4341	-0.243 6544	+1029	+0.907 4584	+0.905 6285	+ 45	+0.393 5661	+0.392 7722	+513
	7	0.251 8579	0.260 0440	1032	0.903 7348	0.901 7773	63	0.391 9506	0.391 1014	518
	8	0.268 2120	0.276 3614	1035	0.899 7561	0.897 6713	81	0.390 2247	0.389 3204	523
	9	0.284 4917	0.292 6022	1037	0.895 5231	0.893 3115	100	0.388 3886	0.387 4294	529
	10	0.300 6922	0.308 7612	1039	0.891 0368	0.888 6990	119	0.386 4428	0.385 4289	534
	11	-0.316 8087	-0.324 8339	+1041	+0.886 2983	+0.883 8348	+138	+0.384 3877	+0.383 3193	+539
	12	0.332 8363	0.340 8152	1042	0.881 3087	0.878 7202	158	0.382 2239	0.381 1014	544
	13	0.348 7701	0.356 7003	1043	0.876 0694	0.873 3566	177	0.379 9520	0.378 7756	549
	14	0.364 6053	0.372 4844	1044	0.870 5819	0.867 7456	197	0.377 5725	0.376 3427	554
	15	0.380 3370	0.388 1626	1044	0.864 8478	0.861 8888	217	0.375 0862	0.373 8032	559
	16	-0.395 9605	-0.403 7302	+1043	+0.858 8688	+0.855 7880	+237	+0.372 4938	+0.371 1580	+563
	17	0.411 4710	0.419 1825	1042	0.852 6468	0.849 4453	257	0.369 7960	0.368 4079	568
	18	0.426 8640	0.434 5150	1041	0.846 1839	0.842 8628	277	0.366 9938	0.365 5538	573
	19	0.442 1349	0.449 7232	1039	0.839 4823	0.836 0427	297	0.364 0881	0.362 5967	577
	20	0.457 2793	0.464 8028	1037	0.832 5442	0.828 9871	318	0.361 0797	0.359 5373	581
	21	-0.472 2932	-0.479 7499	+1034	+0.825 3718	+0.821 6985	+338	+0.357 9696	+0.356 3767	+586
	22	0.487 1724	0.494 5602	1031	0.817 9675	0.814 1791	358	0.354 7587	0.353 1158	590
	23	0.501 9129	0.509 2299	1028	0.810 3337	0.806 4315	379	0.351 4182	0.349 7559	594
	24	0.516 5109	0.523 7553	1024	0.802 4727	0.798 4577	400	0.348 0390	0.346 2977	598
	25	0.530 9626	0.538 1324	1019	0.794 3868	0.790 2601	420	0.344 5320	0.342 7422	602
	26	-0.545 2643	-0.552 3578	+1015	+0.786 0781	+0.781 8410	+441	+0.340 9283	+0.339 0905	+605
	27	0.559 4124	0.566 4277	1009	0.777 5490	0.773 2024	462	0.337 2288	0.335 3434	609
	28	0.573 4032	0.580 3385	1003	0.768 8016	0.764 3467	483	0.333 4344	0.331 5020	613
	29	0.587 2331	0.594 0865	997	0.759 8381	0.755 2760	503	0.329 5463	0.327 5674	616
	30	0.600 8983	0.607 6679	990	0.750 6606	0.745 9923	524	0.325 5654	0.323 5404	619
Aug.	31	-0.614 3949	-0.621 0788	+ 983	+0.741 2713	+0.736 4980	+545	+0.321 4926	+0.319 4220	+623
	1	0.627 7192	0.634 3155	975	0.731 6726	0.726 7954	565	0.317 3289	0.315 2133	626
	2	0.640 8673	0.647 3741	967	0.721 8666	0.716 8866	586	0.313 0754	0.310 9153	629
	3	0.653 8354	0.660 2507	959	0.711 8558	0.706 7744	607	0.308 7332	0.306 5292	632
	4	0.666 6195	0.672 9414	950	0.701 6428	0.696 4612	627	0.304 3034	0.302 0560	635
	5	-0.679 2159	-0.685 4425	+ 940	+0.691 2301	+0.685 9497	+647	+0.299 7871	+0.297 4969	+637
	6	0.691 6207	0.697 7500	930	0.680 6203	0.675 2424	668	0.295 1855	0.292 8530	640
	7	0.703 8300	0.709 8601	920	0.669 8163	0.664 3423	688	0.290 4997	0.288 1256	642
	8	0.715 8400	0.721 7691	909	0.658 8207	0.653 2520	708	0.285 7310	0.283 3160	644
	9	0.727 6470	0.733 4732	897	0.647 6367	0.641 9750	728	0.280 8808	0.278 4255	647
	10	-0.739 2471	-0.744 9683	+ 886	+0.636 2673	+0.630 5140	+747	+0.275 9503	+0.273 4553	+649
	11	0.750 6364	0.756 2509	873	0.624 7156	0.618 8725	767	0.270 9408	0.268 4069	651
	12	0.761 8114	0.767 3174	861	0.612 9850	0.607 0536	787	0.265 8538	0.263 2817	652
	13	0.772 7684	0.778 1641	848	0.601 0789	0.595 0613	806	0.260 6909	0.258 0814	654
	14	0.783 5040	0.788 7877	834	0.589 0012	0.582 8991	825	0.255 4535	0.252 8073	656
	15	-0.794 0147	-0.799 1847	+ 820	+0.576 7554	+0.570 5706	+844	+0.250 1431	+0.247 4611	+657
	16	-0.804 2974	-0.809 3523	+ 806	+0.564 3453	+0.558 0799	+863	+0.244 7615	+0.242 0444	+658

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Aug. 16	-0.804 2974	-0.809 3523	+806	+0.564 3453	+0.558 0799	+ 863	+0.244 7615	+0.242 0444	+658
17	0.814 3491	0.819 2874	791	0.551 7749	0.545 4308	882	0.239 3102	0.236 5590	659
18	0.824 1670	0.828 9875	776	0.539 0480	0.532 6271	900	0.233 7910	0.231 0064	660
19	0.833 7485	0.838 4498	760	0.526 1685	0.519 6727	918	0.228 2054	0.225 3882	661
20	0.843 0910	0.847 6719	744	0.513 1402	0.506 5714	936	0.222 5550	0.219 7061	662
21	-0.852 1921	-0.856 6514	+728	+0.499 9668	+0.493 3269	+ 953	+0.216 8416	+0.213 9617	+662
22	0.861 0494	0.865 3359	711	0.486 6521	0.479 9429	971	0.211 0667	0.208 1567	663
23	0.869 6606	0.873 8733	694	0.473 1998	0.466 4232	988	0.205 2319	0.202 2926	663
24	0.878 0236	0.882 1113	677	0.459 6135	0.452 7712	1005	0.199 3389	0.196 3711	663
25	0.886 1360	0.890 0975	659	0.445 8968	0.438 9906	1021	0.193 3893	0.190 3937	663
26	-0.893 9956	-0.897 8299	+640	+0.432 0532	+0.425 0850	+1037	+0.187 3845	+0.184 3620	+663
27	0.901 6002	0.905 3062	622	0.418 0864	0.411 0579	1053	0.181 3263	0.178 2776	663
28	0.908 9476	0.912 5241	603	0.403 9999	0.396 9129	1069	0.175 2162	0.172 1422	662
29	0.916 0354	0.919 4813	584	0.389 7974	0.382 6538	1085	0.169 0558	0.165 9573	662
30	0.922 8615	0.926 1756	564	0.375 4827	0.368 2844	1100	0.162 8468	0.159 7246	661
31	-0.929 4235	-0.932 6048	+544	+0.361 0594	+0.353 8082	+1114	+0.156 5908	+0.153 4457	+660
Sept. 1	0.935 7192	0.938 7665	524	0.346 5313	0.339 2292	1129	0.150 2895	0.147 1224	659
2	0.941 7464	0.944 6586	503	0.331 9025	0.324 5515	1143	0.143 9446	0.140 7564	658
3	0.947 5029	0.950 2790	482	0.317 1768	0.309 7789	1157	0.137 5579	0.134 3494	656
4	0.952 9867	0.955 6257	461	0.302 3583	0.294 9155	1170	0.131 1311	0.127 9032	655
5	-0.958 1957	-0.960 6965	+440	+0.287 4511	+0.279 9655	+1183	+0.124 6659	+0.121 4195	+653
6	0.963 1279	0.965 4895	418	0.272 4594	0.264 9332	1196	0.118 1642	0.114 9003	651
7	0.967 7812	0.970 0027	396	0.257 3874	0.249 8227	1208	0.111 6279	0.108 3473	649
8	0.972 1538	0.974 2342	374	0.242 2396	0.234 6387	1220	0.105 0588	0.101 7625	647
9	0.976 2437	0.978 1821	352	0.227 0206	0.219 3858	1231	0.098 4588	0.095 1479	645
10	-0.980 0493	-0.981 8451	+329	+0.211 7349	+0.204 0685	+1243	+0.091 8300	+0.088 5054	+642
11	0.983 5692	0.985 2215	306	0.196 3873	0.188 6918	1254	0.085 1743	0.081 8371	639
12	0.986 8018	0.988 3100	283	0.180 9826	0.173 2604	1265	0.078 4939	0.075 1450	636
13	0.989 7460	0.991 1097	259	0.165 5258	0.157 7793	1275	0.071 7907	0.068 4312	633
14	0.992 4010	0.993 6198	235	0.150 0216	0.142 2533	1285	0.065 0669	0.061 6979	630
15	-0.994 7660	-0.995 8396	+212	+0.134 4750	+0.126 6872	+1294	+0.058 3245	+0.054 9469	+627
16	0.996 8404	0.997 7685	188	0.118 8906	0.111 0857	1303	0.051 5655	0.048 1804	623
17	0.998 6238	0.999 4062	163	0.103 2731	0.095 4534	1312	0.044 7920	0.041 4004	620
18	1.000 1157	1.000 7523	139	0.087 6272	0.079 7950	1320	0.038 0060	0.034 6089	616
19	1.001 3160	1.001 8067	114	0.071 9573	0.064 1148	1328	0.031 2095	0.027 8079	612
20	-1.002 2245	-1.002 5693	+ 90	+0.056 2679	+0.048 4172	+1335	+0.024 4043	+0.020 9991	+607
21	1.002 8410	1.003 0396	65	0.040 5632	0.032 7066	1342	0.017 5925	0.014 1847	603
22	1.003 1652	1.003 2177	40	0.024 8479	0.016 9876	1349	0.010 7759	0.007 3664	599
23	1.003 1970	1.003 1032	+ 15	+0.009 1261	+0.001 2640	1355	+0.003 9565	+0.000 5463	594
24	1.002 9363	1.002 6962	- 11	-0.006 5981	-0.014 4597	1361	-0.002 8639	-0.006 2739	589
25	-1.002 3830	-1.001 9966	- 36	-0.022 3202	-0.030 1791	+1366	-0.009 6834	-0.013 0922	+584
26	1.001 5370	1.001 0042	62	0.038 0359	0.045 8901	1371	0.016 5001	0.019 9068	579
27	1.000 3981	0.999 7188	87	0.053 7410	0.061 5881	1376	0.023 3121	0.026 7157	573
28	0.998 9663	0.998 1405	113	0.069 4309	0.077 2689	1380	0.030 1174	0.033 5169	568
29	0.997 2415	0.996 2693	139	0.085 1014	0.092 9280	1384	0.036 9141	0.040 3086	562
30	-0.995 2239	-0.994 1053	-165	-0.100 7480	-0.108 5609	+1387	-0.043 7002	-0.047 0887	+556
Oct. 1	-0.992 9135	-0.991 6485	-191	-0.116 3662	-0.124 1632	+1390	-0.050 4739	-0.053 8555	+550

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Oct. 1	-0.992 9135	-0.991 6485	191	-0.116 3662	-0.124 1632	+1390	-0.050 4739	-0.053 8555	+550
2	0.990 3104	0.988 8992	217	0.131 9514	0.139 7302	1393	0.057 2333	0.060 6069	544
3	0.987 4149	0.985 8576	243	0.147 4991	0.155 2575	1395	0.063 9762	0.067 3409	538
4	0.984 2273	0.982 5241	270	0.163 0047	0.170 7402	1397	0.070 7007	0.074 0554	531
5	0.980 7479	0.978 8988	296	0.178 4634	0.186 1737	1398	0.077 4047	0.080 7484	524
6	-0.976 9770	-0.974 9825	322	-0.193 8705	-0.201 5532	+1399	-0.084 0862	-0.087 4179	+517
7	0.972 9154	0.970 7757	349	0.209 2212	0.216 8739	1400	0.090 7433	0.094 0620	510
8	0.968 5636	0.966 2792	375	0.224 5106	0.232 1307	1400	0.097 3737	0.100 6782	503
9	0.963 9226	0.961 4939	402	0.239 7336	0.247 3186	1400	0.103 9753	0.107 2647	496
10	0.958 9934	0.956 4211	428	0.254 8852	0.262 4327	1399	0.110 5461	0.113 8193	488
11	-0.953 7773	-0.951 0621	455	-0.269 9605	-0.277 4679	+1398	-0.117 0839	-0.120 3397	+480
12	0.948 2758	0.945 4186	481	0.284 9544	0.292 4193	1396	0.123 5865	0.126 8240	472
13	0.942 4907	0.939 4924	508	0.299 8621	0.307 2821	1394	0.130 0519	0.133 2700	464
14	0.936 4239	0.933 2854	534	0.314 6788	0.322 0516	1392	0.136 4780	0.139 6757	456
15	0.930 0772	0.926 7996	561	0.329 4000	0.336 7233	1389	0.142 8628	0.146 0391	448
16	-0.923 4529	-0.920 0373	587	-0.344 0211	-0.351 2928	+1386	-0.149 2044	-0.152 3584	+439
17	0.916 5531	0.913 0006	614	0.358 5378	0.365 7557	1383	0.155 5009	0.158 6316	431
18	0.909 3800	0.905 6917	641	0.372 9459	0.380 1080	1379	0.161 7503	0.164 8569	422
19	0.901 9358	0.898 1127	667	0.387 2413	0.394 3454	1374	0.167 9510	0.171 0324	413
20	0.894 2226	0.890 2658	693	0.401 4198	0.408 4640	1369	0.174 1010	0.177 1564	404
21	-0.886 2426	-0.882 1533	720	-0.415 4774	-0.422 4596	+1364	-0.180 1985	-0.183 2271	+394
22	0.877 9982	0.873 7774	746	0.429 4101	0.436 3284	1359	0.186 2419	0.189 2427	385
23	0.869 4914	0.865 1404	772	0.443 2139	0.450 0662	1353	0.192 2293	0.195 2014	375
24	0.860 7247	0.856 2445	799	0.456 8848	0.463 6692	1346	0.198 1589	0.201 1015	365
25	0.851 7002	0.847 0920	825	0.470 4190	0.477 1335	1339	0.204 0291	0.206 9414	356
26	-0.842 4203	-0.837 6853	851	-0.483 8124	-0.490 4550	+1332	-0.209 8382	-0.212 7192	+346
27	0.832 8874	0.828 0268	877	0.497 0610	0.503 6298	1324	0.215 5843	0.218 4333	335
28	0.823 1039	0.818 1190	903	0.510 1609	0.516 6539	1316	0.221 2659	0.224 0819	325
29	0.813 0724	0.807 9644	929	0.523 1082	0.529 5234	1307	0.226 8810	0.229 6632	314
30	0.802 7952	0.797 5653	955	0.535 8989	0.542 2343	1298	0.232 4281	0.235 1755	303
31	-0.792 2750	-0.786 9246	980	-0.548 5290	-0.554 7825	+1289	-0.237 9053	-0.240 6172	+293
Nov 1	0.781 5145	0.776 0450	1006	0.560 9944	0.567 1641	1279	0.243 3111	0.245 9867	282
2	0.770 5165	0.764 9293	1032	0.573 2911	0.579 3750	1269	0.248 6437	0.251 2820	271
3	0.759 2837	0.753 5802	1057	0.585 4152	0.591 4113	1258	0.253 9013	0.256 5014	260
4	0.747 8191	0.742 0008	1082	0.597 3626	0.603 2687	1247	0.259 0822	0.261 6434	249
5	-0.736 1257	-0.730 1943	1107	-0.609 1290	-0.614 9431	+1235	-0.264 1847	-0.266 7059	+237
6	0.724 2070	0.718 1642	1132	0.620 7105	0.626 4306	1223	0.269 2069	0.271 6874	226
7	0.712 0664	0.705 9140	1157	0.632 1029	0.637 7269	1211	0.274 1473	0.276 5862	214
8	0.699 7074	0.693 4472	1182	0.643 3021	0.648 8281	1198	0.279 0040	0.281 4005	202
9	0.687 1340	0.680 7682	1206	0.654 3043	0.659 7303	1184	0.283 7754	0.286 1286	190
10	-0.674 3504	-0.667 8810	1231	-0.665 1056	-0.670 4298	+1170	-0.288 4599	-0.290 7690	+178
11	0.661 3605	0.654 7896	1255	0.675 7024	0.680 9231	1166	0.293 0558	0.295 3201	166
12	0.648 1688	0.641 4986	1279	0.686 0914	0.691 2069	1141	0.297 5618	0.299 7806	154
13	0.634 7795	0.628 0122	1303	0.696 2692	0.701 2780	1126	0.301 9764	0.304 1489	142
14	0.621 1971	0.614 3348	1326	0.706 2328	0.711 1334	1111	0.306 2981	0.308 4237	129
15	-0.607 4259	-0.600 4708	1350	-0.715 9793	-0.720 7703	+1095	-0.310 5257	-0.312 6038	+117
16	-0.593 4701	-0.586 4243	1373	-0.725 5059	-0.730 1858	+1078	-0.314 6580	-0.316 6880	+104

GREENWICH MEAN TIME.

Date.	X True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Y True Equinox.		Reduc. to Mean Eq'x of 1923.0.	Z True Equinox.		Reduc. to Mean Eq'x of 1923.0.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.
Nov. 16	-0.593 4701	-0.586 4243	-1373	-0.725 5059	-0.730 1858	+1078	-0.314 6590	-0.316 6880	+104
17	0.579 3340	0.572 1997	1396	0.734 8097	0.739 3773	1061	0.318 6937	0.320 6750	91
18	0.565 0219	0.557 8012	1419	0.743 8882	0.748 3421	1044	0.322 6317	0.324 5636	78
19	0.550 5381	0.543 2332	1441	0.752 7387	0.757 0776	1026	0.326 4707	0.328 3527	66
20	0.535 8870	0.528 4999	1463	0.761 3585	0.765 5811	1007	0.330 2096	0.332 0412	53
21	-0.521 0726	-0.513 6055	-1485	-0.769 7452	-0.773 8504	+ 988	-0.333 8473	-0.335 6279	+ 39
22	0.506 0993	0.498 5544	1507	0.777 8964	0.781 8829	969	0.337 3827	0.339 1117	26
23	0.490 9715	0.483 3510	1529	0.785 8095	0.789 8761	949	0.340 8147	0.342 4917	13
24	0.475 6935	0.467 9995	1550	0.793 4822	0.797 2276	929	0.344 1424	0.345 7667	+ 0
25	0.460 2695	0.452 5041	1571	0.800 9121	0.804 5352	908	0.347 3645	0.348 9357	- 14
26	-0.444 7039	-0.436 8695	-1591	-0.808 0968	-0.811 5965	+ 887	-0.350 4802	-0.351 9978	- 27
27	0.429 0013	0.421 0999	1611	0.815 0340	0.818 4091	866	0.353 4885	0.354 9520	41
28	0.413 1659	0.405 1998	1631	0.821 7215	0.824 9708	844	0.356 3883	0.357 7972	54
29	0.397 2023	0.389 1739	1651	0.828 1568	0.831 2792	821	0.359 1787	0.360 5326	68
30	0.381 1151	0.373 0266	1670	0.834 3377	0.837 3321	798	0.361 8587	0.363 1570	82
Dec. 1	-0.364 9089	-0.356 7626	-1689	-0.840 2620	-0.843 1272	+ 775	-0.364 4273	-0.365 6695	- 95
2	0.348 5884	0.340 3868	1707	0.845 9274	0.848 6623	751	0.366 8836	0.368 0694	109
3	0.332 1585	0.323 9040	1725	0.851 3315	0.853 9349	727	0.369 2267	0.370 3555	123
4	0.315 6241	0.307 3194	1743	0.856 4722	0.858 9431	702	0.371 4557	0.372 5271	137
5	0.298 9905	0.290 6381	1760	0.861 3474	0.863 6849	677	0.373 5696	0.374 5832	151
6	-0.282 2629	-0.273 8656	-1777	-0.865 9552	-0.868 1581	+ 651	-0.375 5677	-0.376 5230	-165
7	0.265 4468	0.257 0073	1794	0.870 2935	0.872 3611	625	0.377 4491	0.378 3459	179
8	0.248 5477	0.240 0689	1810	0.874 3608	0.876 2923	598	0.379 2132	0.380 0510	193
9	0.231 5714	0.223 0560	1825	0.878 1556	0.879 9503	571	0.380 8592	0.381 6378	207
10	0.214 5234	0.205 9744	1840	0.881 6765	0.883 3340	544	0.382 3866	0.383 1057	221
11	-0.197 4096	-0.188 8298	-1855	-0.884 9226	-0.886 4423	+ 516	-0.383 7949	-0.384 4543	-235
12	0.180 2356	0.171 6277	1869	0.887 8929	0.889 2744	487	0.385 0837	0.385 6832	249
13	0.163 0069	0.154 3738	1883	0.890 5867	0.891 8298	459	0.386 2527	0.386 7921	263
14	0.145 7291	0.137 0735	1896	0.893 0035	0.894 1079	430	0.387 3015	0.387 7808	277
15	0.128 4076	0.119 7322	1908	0.895 1428	0.896 1082	400	0.388 2299	0.388 6489	291
16	-0.111 0478	-0.102 3552	-1920	-0.897 0041	-0.897 8304	+ 370	-0.389 0377	-0.389 3963	-305
17	0.093 6550	0.084 9479	1932	0.898 5870	0.899 2739	340	0.389 7247	0.390 0228	319
18	0.076 2345	0.067 5155	1943	0.899 8912	0.900 4388	309	0.390 2907	0.390 5283	333
19	0.058 7915	0.050 0632	1953	0.900 9166	0.901 3247	278	0.390 7357	0.390 9127	347
20	0.041 3312	0.032 5962	1963	0.901 6631	0.901 9316	247	0.391 0595	0.391 1760	361
21	-0.023 8589	-0.015 1199	-1972	-0.902 1303	-0.902 2592	+ 215	-0.391 2622	-0.391 3181	-375
22	-0.006 3798	+0.002 3607	1980	0.902 3183	0.902 3076	183	0.391 3436	0.391 3389	389
23	+0.011 1011	0.019 8406	1988	0.902 2270	0.902 0767	150	0.391 3038	0.391 2384	403
24	0.028 5786	0.037 3145	1996	0.901 8566	0.901 5667	117	0.391 1427	0.391 0167	417
25	0.046 0476	0.054 7773	2002	0.901 2070	0.900 7775	84	0.390 8604	0.390 6738	430
26	+0.063 5030	+0.072 2240	-2008	-0.900 2783	-0.899 7093	+ 51	-0.390 4570	-0.390 2099	-444
27	0.080 9397	0.089 6494	2014	0.899 0705	0.898 3620	+ 17	0.389 9325	0.389 6249	458
28	0.098 3524	0.107 0482	2019	0.897 5838	0.896 7359	- 17	0.389 2870	0.388 9190	471
29	0.115 7361	0.124 4154	2023	0.895 8183	0.894 8311	51	0.388 5207	0.388 0922	485
30	0.133 0854	0.141 7455	2026	0.893 7743	0.892 6478	85	0.387 6335	0.387 1447	499
31	+0.150 3950	+0.159 0332	-2029	-0.891 4518	-0.890 1862	- 120	-0.386 6257	-0.386 0766	-512
32	+0.167 6595	+0.176 2730	-2031	-0.888 8512	-0.887 4468	- 155	-0.385 4975	-0.384 8883	-525

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 1.					JANUARY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 19 16.12	2.2802	+18 5 11.1	+2.134	0	7 11 31.75	2.3755	+17 47 16.8	-2.974
1	5 21 33.03	2.2834	18 7 16.2	2.036	1	7 13 54.30	2.3760	17 44 15.1	3.084
2	5 23 50.13	2.2866	18 9 15.4	1.937	2	7 16 16.87	2.3765	17 41 6.7	3.193
3	5 26 7.42	2.2897	18 11 8.7	1.838	3	7 18 39.48	2.3770	17 37 51.9	3.302
4	5 28 24.90	2.2928	18 12 55.9	1.738	4	7 21 2.11	2.3773	17 34 30.5	3.411
5	5 30 42.56	2.2958	18 14 37.2	1.638	5	7 23 24.75	2.3775	17 31 2.6	3.518
6	5 33 0.40	2.2988	18 16 12.5	1.537	6	7 25 47.41	2.3777	17 27 28.3	3.627
7	5 35 18.42	2.3018	18 17 41.7	1.436	7	7 28 10.08	2.3780	17 23 47.4	3.736
8	5 37 36.62	2.3048	18 19 4.8	1.335	8	7 30 32.77	2.3781	17 20 0.0	3.843
9	5 39 54.99	2.3076	18 20 21.9	1.232	9	7 32 55.45	2.3781	17 16 6.2	3.950
10	5 42 13.53	2.3104	18 21 32.6	1.128	10	7 35 18.14	2.3782	17 12 6.0	4.057
11	5 44 32.24	2.3132	18 22 37.2	1.026	11	7 37 40.83	2.3781	17 7 59.3	4.165
12	5 46 51.11	2.3158	18 23 35.7	0.923	12	7 40 3.51	2.3779	17 3 46.2	4.271
13	5 49 10.14	2.3186	18 24 28.0	0.818	13	7 42 26.18	2.3778	16 59 26.8	4.378
14	5 51 29.34	2.3212	18 25 13.9	0.714	14	7 44 48.85	2.3776	16 55 0.9	4.483
15	5 53 48.68	2.3237	18 25 53.7	0.610	15	7 47 11.49	2.3773	16 50 28.8	4.588
16	5 56 8.18	2.3263	18 26 27.1	0.504	16	7 49 34.13	2.3770	16 45 50.3	4.693
17	5 58 27.83	2.3287	18 26 54.2	0.398	17	7 51 56.73	2.3766	16 41 5.6	4.798
18	6 0 47.62	2.3310	18 27 14.9	0.292	18	7 54 19.32	2.3762	16 36 14.5	4.903
19	6 3 7.55	2.3333	18 27 29.3	0.188	19	7 56 41.88	2.3757	16 31 17.3	5.006
20	6 5 27.62	2.3357	18 27 37.4	+0.081	20	7 59 4.40	2.3752	16 26 13.8	5.109
21	6 7 47.83	2.3379	18 27 39.0	-0.027	21	8 1 26.90	2.3746	16 21 4.2	5.212
22	6 10 8.17	2.3401	18 27 34.2	0.134	22	8 3 49.35	2.3739	16 15 48.4	5.315
23	6 12 28.64	2.3423	+18 27 22.9	-0.212	23	8 6 11.77	2.3733	+16 10 26.4	-5.417
JANUARY 2.					JANUARY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 14 49.24	2.3443	+18 27 5.2	-0.349	0	8 8 34.14	2.3725	+16 4 58.4	-5.518
1	6 17 9.96	2.3463	18 26 41.0	0.457	1	8 10 56.47	2.3717	15 59 24.3	5.618
2	6 19 30.79	2.3482	18 26 10.4	0.565	2	8 13 18.75	2.3709	15 53 44.2	5.718
3	6 21 51.74	2.3501	18 25 33.2	0.674	3	8 15 40.98	2.3701	15 47 58.1	5.818
4	6 24 12.80	2.3519	18 24 49.5	0.783	4	8 18 3.16	2.3692	15 42 6.0	5.917
5	6 26 33.97	2.3537	18 23 59.3	0.892	5	8 20 25.28	2.3682	15 36 8.1	6.015
6	6 28 55.24	2.3554	18 23 2.5	1.000	6	8 22 47.34	2.3672	15 30 4.2	6.113
7	6 31 16.62	2.3570	18 21 59.3	1.109	7	8 25 9.35	2.3662	15 23 54.5	6.210
8	6 33 38.08	2.3586	18 20 49.4	1.219	8	8 27 31.28	2.3651	15 17 39.0	6.307
9	6 35 59.65	2.3602	18 19 33.0	1.328	9	8 29 53.16	2.3641	15 11 17.7	6.403
10	6 38 21.30	2.3616	18 18 10.1	1.438	10	8 32 14.97	2.3628	15 4 50.7	6.498
11	6 40 43.04	2.3630	18 16 40.5	1.548	11	8 34 36.70	2.3617	14 58 18.0	6.593
12	6 43 4.86	2.3643	18 15 4.4	1.657	12	8 36 58.37	2.3605	14 51 39.6	6.686
13	6 45 26.76	2.3656	18 13 21.7	1.767	13	8 39 19.96	2.3592	14 44 55.7	6.779
14	6 47 48.73	2.3668	18 11 32.4	1.877	14	8 41 41.47	2.3579	14 38 6.1	6.872
15	6 50 10.78	2.3680	18 9 36.5	1.987	15	8 44 2.91	2.3566	14 31 11.1	6.963
16	6 52 32.89	2.3690	18 7 34.0	2.097	16	8 46 24.26	2.3552	14 24 10.6	7.053
17	6 54 55.06	2.3701	18 5 24.9	2.206	17	8 48 45.54	2.3539	14 17 4.7	7.143
18	6 57 17.30	2.3711	18 3 9.3	2.316	18	8 51 6.73	2.3525	14 9 53.4	7.233
19	6 59 39.59	2.3719	18 0 47.0	2.427	19	8 53 27.84	2.3511	14 2 36.8	7.321
20	7 2 1.93	2.3728	17 58 18.1	2.537	20	8 55 48.86	2.3496	13 55 14.9	7.409
21	7 4 24.32	2.3736	17 55 42.6	2.646	21	8 58 9.79	2.3481	13 47 47.7	7.496
22	7 6 46.76	2.3743	17 53 0.6	2.755	22	9 0 30.63	2.3466	13 40 15.4	7.581
23	7 9 9.24	2.3749	17 50 12.0	2.865	23	9 2 51.38	2.3451	13 32 38.0	7.667
24	7 11 31.75	2.3755	+17 47 16.8	-2.974	24	9 5 12.04	2.3436	+13 24 55.4	-7.752

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 5.					JANUARY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 5 12.04	2.3436	+13 24 55.4	7.752	0	10 55 46.38	2.2658	+5 53 49.7	-10.648
1	9 7 32.61	2.3420	13 17 7.8	7.834	1	10 58 2.29	2.2646	5 43 9.8	10.882
2	9 9 53.08	2.3404	13 9 15.3	7.917	2	11 0 18.13	2.2634	5 32 27.8	10.716
3	9 12 13.46	2.3388	13 1 17.7	7.999	3	11 2 33.90	2.2622	5 21 43.9	-10.748
4	9 14 33.74	2.3372	12 53 15.4	8.079	4	11 4 49.59	2.2609	5 10 58.1	10.778
5	9 16 53.92	2.3355	12 45 8.2	8.160	5	11 7 5.21	2.2597	5 0 10.5	10.808
6	9 19 14.00	2.3339	12 36 56.2	8.239	6	11 9 20.76	2.2586	4 49 21.1	10.837
7	9 21 33.99	2.3322	12 28 39.5	8.317	7	11 11 36.24	2.2575	4 38 30.0	10.865
8	9 23 53.87	2.3305	12 20 18.2	8.394	8	11 13 51.66	2.2564	4 27 37.3	10.891
9	9 26 13.65	2.3289	12 11 52.2	8.471	9	11 16 7.01	2.2553	4 16 43.1	10.917
10	9 28 33.34	2.3272	12 3 21.7	8.546	10	11 18 22.30	2.2544	4 5 47.3	10.941
11	9 30 52.91	2.3254	11 54 46.7	8.620	11	11 20 37.54	2.2534	3 54 50.2	10.963
12	9 33 12.39	2.3237	11 46 7.3	8.693	12	11 22 52.71	2.2524	3 43 51.7	10.986
13	9 35 31.76	2.3220	11 37 23.5	8.766	13	11 25 7.83	2.2515	3 32 51.9	11.007
14	9 37 51.03	2.3202	11 28 35.4	8.838	14	11 27 22.89	2.2506	3 21 50.9	11.026
15	9 40 10.19	2.3185	11 19 43.0	8.908	15	11 29 37.90	2.2498	3 10 48.8	11.045
16	9 42 29.25	2.3168	11 10 46.4	8.977	16	11 31 52.87	2.2491	2 59 45.5	11.062
17	9 44 48.21	2.3151	11 1 45.7	9.046	17	11 34 7.79	2.2483	2 48 41.3	11.078
18	9 47 7.06	2.3133	10 52 40.9	9.113	18	11 36 22.66	2.2475	2 37 36.1	11.093
19	9 49 25.81	2.3117	10 43 32.1	9.180	19	11 38 37.49	2.2468	2 26 30.1	11.108
20	9 51 44.46	2.3099	10 34 19.3	9.246	20	11 40 52.27	2.2461	2 15 23.2	11.122
21	9 54 3.00	2.3082	10 25 2.6	9.310	21	11 43 7.02	2.2455	2 4 15.5	11.133
22	9 56 21.44	2.3064	10 15 42.1	9.373	22	11 45 21.73	2.2449	1 53 7.2	11.143
23	9 58 39.77	2.3047	+10 6 17.8	9.436	23	11 47 36.41	2.2443	+1 41 58.3	-11.153
JANUARY 6.					JANUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 0 58.00	2.3030	+ 9 56 49.8	9.197	0	11 49 51.05	2.2438	+1 30 48.8	-11.162
1	10 3 16.13	2.3013	9 47 18.1	9.557	1	11 52 5.66	2.2433	1 19 38.8	11.169
2	10 5 34.15	2.2996	9 37 42.9	9.617	2	11 54 20.25	2.2429	1 8 28.5	11.176
3	10 7 52.08	2.2979	9 28 4.1	9.675	3	11 56 34.81	2.2425	0 57 17.7	11.181
4	10 10 9.90	2.2962	9 18 21.9	9.732	4	11 58 49.35	2.2422	0 46 6.8	11.184
5	10 12 27.63	2.2946	9 8 36.3	9.788	5	12 1 3.87	2.2418	0 34 55.6	11.188
6	10 14 45.25	2.2928	8 58 47.3	9.843	6	12 3 18.37	2.2415	0 23 44.2	11.190
7	10 17 2.77	2.2912	8 48 55.1	9.897	7	12 5 32.85	2.2412	0 12 32.8	11.190
8	10 19 20.20	2.2896	8 38 59.7	9.950	8	12 7 47.32	2.2411	+0 1 21.4	11.190
9	10 21 37.52	2.2879	8 29 1.1	10.002	9	12 10 1.78	2.2409	-0 9 50.0	11.188
10	10 23 54.75	2.2863	8 18 59.4	10.053	10	12 12 16.23	2.2408	0 21 1.2	11.186
11	10 26 11.88	2.2848	8 8 54.7	10.103	11	12 14 30.67	2.2407	0 32 12.3	11.183
12	10 28 28.92	2.2832	7 58 47.1	10.151	12	12 16 45.11	2.2406	0 43 23.1	11.178
13	10 30 45.86	2.2816	7 48 36.6	10.198	13	12 18 59.54	2.2406	0 54 33.6	11.172
14	10 33 2.71	2.2801	7 38 23.3	10.245	14	12 21 13.98	2.2407	1 5 43.7	11.164
15	10 35 19.47	2.2786	7 28 7.2	10.290	15	12 23 28.42	2.2407	1 16 53.3	11.156
16	10 37 36.14	2.2770	7 17 48.5	10.334	16	12 25 42.86	2.2408	1 28 2.4	11.147
17	10 39 52.71	2.2756	7 7 27.1	10.378	17	12 27 57.31	2.2409	1 39 10.9	11.137
18	10 42 9.21	2.2742	6 57 3.1	10.420	18	12 30 11.77	2.2411	1 50 18.8	11.126
19	10 44 25.61	2.2727	6 46 36.7	10.460	19	12 32 26.24	2.2413	2 1 26.0	11.113
20	10 46 41.93	2.2713	6 36 7.9	10.500	20	12 34 40.73	2.2416	2 12 32.4	11.099
21	10 48 58.16	2.2699	6 25 36.7	10.539	21	12 36 55.23	2.2419	2 23 37.9	11.084
22	10 51 14.32	2.2686	6 15 3.2	10.577	22	12 39 9.76	2.2422	2 34 42.5	11.069
23	10 53 30.39	2.2672	6 4 27.5	10.613	23	12 41 24.30	2.2426	2 45 46.2	11.052
24	10 55 46.38	2.2658	+ 5 53 49.7	-10.648	24	12 43 38.87	2.2431	-2 56 48.8	-11.034

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 9.					JANUARY 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 43 38.87	2.2431	- 2 56 48.8	-11.034	0	14 32 26.75	2.3009	-11 5 41.0	-8.941
1	12 45 53.47	2.2435	3 7 50.3	11.015	1	14 34 44.86	2.3027	11 14 35.4	8.872
2	12 48 8.09	2.2440	3 18 50.6	10.995	2	14 37 3.08	2.3045	11 23 25.7	8.803
3	12 50 22.75	2.2445	3 29 49.7	10.974	3	14 39 21.40	2.3063	11 32 11.8	8.733
4	12 52 37.43	2.2451	3 40 47.5	10.952	4	14 41 39.83	2.3080	11 40 53.7	8.662
5	12 54 52.16	2.2457	3 51 43.9	10.928	5	14 43 58.36	2.3098	11 49 31.3	8.591
6	12 57 6.92	2.2463	4 2 38.9	10.904	6	14 46 17.00	2.3116	11 58 4.6	8.518
7	12 59 21.72	2.2470	4 13 32.4	10.878	7	14 48 35.75	2.3134	12 6 33.5	8.445
8	13 1 36.56	2.2477	4 24 24.3	10.852	8	14 50 54.61	2.3152	12 14 58.0	8.371
9	13 3 51.44	2.2485	4 35 14.7	10.825	9	14 53 13.57	2.3170	12 23 18.0	8.295
10	13 6 6.38	2.2493	4 46 3.3	10.795	10	14 55 32.65	2.3188	12 31 33.4	8.218
11	13 8 21.36	2.2501	4 56 50.1	10.766	11	14 57 51.83	2.3206	12 39 44.2	8.142
12	13 10 36.39	2.2509	5 7 35.2	10.736	12	15 0 11.12	2.3224	12 47 50.4	8.064
13	13 12 51.47	2.2518	5 18 18.4	10.703	13	15 2 30.52	2.3242	12 55 51.9	7.985
14	13 15 6.61	2.2527	5 28 59.6	10.670	14	15 4 50.02	2.3259	13 3 48.6	7.905
15	13 17 21.80	2.2537	5 39 38.8	10.636	15	15 7 9.63	2.3277	13 11 40.5	7.824
16	13 19 37.06	2.2547	5 50 15.9	10.602	16	15 9 29.35	2.3296	13 19 27.5	7.743
17	13 21 52.37	2.2557	6 0 51.0	10.566	17	15 11 49.18	2.3313	13 27 9.7	7.662
18	13 24 7.75	2.2568	6 11 23.8	10.528	18	15 14 9.11	2.3330	13 34 46.9	7.578
19	13 26 23.19	2.2579	6 21 54.3	10.490	19	15 16 29.14	2.3348	13 42 19.1	7.494
20	13 28 38.70	2.2590	6 32 22.6	10.451	20	15 18 49.28	2.3366	13 49 46.2	7.409
21	13 30 54.27	2.2602	6 42 48.4	10.410	21	15 21 9.53	2.3383	13 57 8.2	7.323
22	13 33 9.92	2.2614	6 53 11.8	10.369	22	15 23 29.88	2.3400	14 4 25.0	7.238
23	13 35 25.64	2.2627	- 7 3 32.7	-10.327	23	15 25 50.33	2.3417	-14 11 36.7	-7.151
JANUARY 10.					JANUARY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 37 41.44	2.2639	- 7 13 51.0	-10.283	0	15 28 10.88	2.3433	-14 18 43.1	-7.062
1	13 39 57.31	2.2652	7 24 6.7	10.239	1	15 30 31.53	2.3450	14 25 44.2	6.974
2	13 42 13.26	2.2665	7 34 19.7	10.193	2	15 32 52.28	2.3467	14 32 40.0	6.885
3	13 44 29.29	2.2679	7 44 29.9	10.147	3	15 35 13.13	2.3483	14 39 30.4	6.795
4	13 46 45.41	2.2693	7 54 37.3	10.100	4	15 37 34.08	2.3500	14 46 15.4	6.704
5	13 49 1.60	2.2706	8 4 41.9	10.052	5	15 39 55.13	2.3516	14 52 54.9	6.612
6	13 51 17.88	2.2720	8 14 43.5	10.002	6	15 42 16.27	2.3531	14 59 28.8	6.520
7	13 53 34.24	2.2734	8 24 42.1	9.951	7	15 44 37.50	2.3547	15 5 57.3	6.427
8	13 55 50.69	2.2749	8 34 37.6	9.899	8	15 46 58.83	2.3562	15 12 20.1	6.333
9	13 58 7.23	2.2764	8 44 30.0	9.847	9	15 49 20.24	2.3577	15 18 37.3	6.239
10	14 0 23.86	2.2779	8 54 19.3	9.793	10	15 51 41.75	2.3592	15 24 48.8	6.144
11	14 2 40.58	2.2794	9 4 5.2	9.738	11	15 54 3.34	2.3606	15 30 54.6	6.049
12	14 4 57.39	2.2809	9 13 47.9	9.683	12	15 56 25.02	2.3620	15 36 54.7	5.953
13	14 7 14.29	2.2825	9 23 27.2	9.627	13	15 58 46.78	2.3634	15 42 48.9	5.855
14	14 9 31.29	2.2842	9 33 3.1	9.569	14	16 1 8.63	2.3648	15 48 37.3	5.758
15	14 11 48.39	2.2858	9 42 35.5	9.511	15	16 3 30.56	2.3661	15 54 19.9	5.660
16	14 14 5.59	2.2875	9 52 4.4	9.452	16	16 5 52.56	2.3674	15 59 56.5	5.561
17	14 16 22.89	2.2890	10 1 29.7	9.391	17	16 8 14.65	2.3687	16 5 27.2	5.462
18	14 18 40.27	2.2906	10 10 51.3	9.328	18	16 10 36.81	2.3698	16 10 52.0	5.362
19	14 20 57.76	2.2923	10 20 9.2	9.267	19	16 12 59.03	2.3710	16 16 10.7	5.261
20	14 23 15.35	2.2941	10 29 23.4	9.204	20	16 15 21.33	2.3723	16 21 23.3	5.161
21	14 25 33.05	2.2958	10 38 33.7	9.139	21	16 17 43.71	2.3734	16 26 30.0	5.059
22	14 27 50.85	2.2975	10 47 40.1	9.073	22	16 20 6.14	2.3743	16 31 30.4	4.956
23	14 30 8.75	2.2992	10 56 42.5	9.007	23	16 22 28.63	2.3754	16 36 24.7	4.853
24	14 32 26.75	2.3009	-11 5 41.0	-8.941	24	16 24 51.19	2.3765	-16 41 12.8	-4.751

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 13.					JANUARY 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 24 51.19	2.3765	-16 41 12.8	-4.751	0	18 19 5.03	2.3610	-18 24 36.8	-0.484
1	16 27 13.81	2.3773	16 45 54.8	4.648	1	18 21 26.64	2.3592	18 24 4.5	0.593
2	16 29 36.47	2.3783	16 50 30.5	4.543	2	18 23 48.13	2.3573	18 23 25.6	0.702
3	16 31 59.20	2.3792	16 54 59.9	4.438	3	18 26 9.52	2.3555	18 22 40.3	0.809
4	16 34 21.97	2.3799	16 59 23.1	4.333	4	18 28 30.79	2.3535	18 21 48.5	0.918
5	16 36 44.79	2.3807	17 3 39.9	4.228	5	18 30 51.94	2.3515	18 20 50.2	1.025
6	16 39 7.66	2.3814	17 7 50.4	4.123	6	18 33 12.97	2.3495	18 19 45.5	1.131
7	16 41 30.56	2.3821	17 11 54.6	4.017	7	18 35 33.88	2.3473	18 18 34.5	1.237
8	16 43 53.51	2.3827	17 15 52.4	3.909	8	18 37 54.65	2.3451	18 17 17.0	1.344
9	16 46 16.48	2.3832	17 19 43.7	3.802	9	18 40 15.29	2.3428	18 15 53.2	1.449
10	16 48 39.50	2.3838	17 23 28.7	3.696	10	18 42 35.79	2.3406	18 14 23.1	1.555
11	16 51 2.54	2.3843	17 27 7.2	3.588	11	18 44 56.16	2.3382	18 12 46.6	1.660
12	16 53 25.61	2.3847	17 30 39.2	3.480	12	18 47 16.38	2.3358	18 11 3.9	1.764
13	16 55 48.70	2.3850	17 34 4.8	3.372	13	18 49 36.46	2.3334	18 9 14.9	1.868
14	16 58 11.81	2.3854	17 37 23.8	3.263	14	18 51 56.39	2.3308	18 7 19.7	1.972
15	17 0 34.95	2.3857	17 40 36.3	3.154	15	18 54 16.16	2.3283	18 5 18.3	2.074
16	17 2 58.09	2.3858	17 43 42.3	3.045	16	18 56 35.78	2.3257	18 3 10.8	2.177
17	17 5 21.24	2.3860	17 46 41.7	2.935	17	18 58 55.24	2.3230	18 0 57.0	2.280
18	17 7 44.41	2.3861	17 49 34.5	2.826	18	19 1 14.54	2.3203	17 58 37.2	2.381
19	17 10 7.57	2.3861	17 52 20.8	2.717	19	19 3 33.68	2.3176	17 56 11.3	2.482
20	17 12 30.74	2.3861	17 55 0.5	2.607	20	19 5 52.65	2.3147	17 53 39.4	2.583
21	17 14 53.90	2.3860	17 57 33.6	2.496	21	19 8 11.44	2.3118	17 51 1.4	2.683
22	17 17 17.06	2.3859	18 0 0.0	2.386	22	19 10 30.07	2.3090	17 48 17.5	2.782
23	17 19 40.21	2.3857	-18 2 19.9	-2.276	23	19 12 48.52	2.3060	-17 45 27.6	+2.881
JANUARY 14.					JANUARY 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 22 3.34	2.3854	-18 4 33.1	-2.165	0	19 15 6.79	2.3030	-17 42 31.8	+2.979
1	17 24 26.46	2.3851	18 6 39.7	2.051	1	19 17 24.88	2.2999	17 39 30.1	3.077
2	17 26 49.55	2.3847	18 8 39.6	1.943	2	19 19 42.78	2.2968	17 36 22.6	3.173
3	17 29 12.62	2.3843	18 10 32.9	1.832	3	19 22 0.50	2.2937	17 33 9.3	3.270
4	17 31 35.67	2.3838	18 12 19.5	1.722	4	19 24 18.03	2.2906	17 29 50.2	3.365
5	17 33 58.68	2.3833	18 13 59.5	1.611	5	19 26 35.37	2.2874	17 26 25.5	3.460
6	17 36 21.66	2.3827	18 15 32.8	1.499	6	19 28 52.52	2.2842	17 22 55.0	3.555
7	17 38 44.60	2.3820	18 16 59.4	1.388	7	19 31 9.48	2.2809	17 19 18.9	3.649
8	17 41 7.50	2.3812	18 18 19.4	1.277	8	19 33 26.23	2.2776	17 15 37.1	3.742
9	17 43 30.34	2.3803	18 19 32.7	1.167	9	19 35 42.79	2.2742	17 11 49.8	3.834
10	17 45 53.14	2.3796	18 20 39.4	1.056	10	19 37 59.14	2.2708	17 7 57.0	3.927
11	17 48 15.89	2.3787	18 21 39.4	0.945	11	19 40 15.29	2.2674	17 3 58.6	4.018
12	17 50 38.58	2.3777	18 22 32.8	0.834	12	19 42 31.23	2.2639	16 59 54.8	4.108
13	17 53 1.21	2.3766	18 23 19.5	0.723	13	19 44 46.96	2.2605	16 55 45.6	4.198
14	17 55 23.77	2.3755	18 23 59.6	0.612	14	19 47 2.49	2.2570	16 51 31.0	4.287
15	17 57 46.27	2.3743	18 24 33.0	0.502	15	19 49 17.80	2.2534	16 47 11.1	4.375
16	18 0 8.69	2.3731	18 24 59.8	0.392	16	19 51 32.90	2.2499	16 42 46.0	4.462
17	18 2 31.04	2.3718	18 25 20.0	0.281	17	19 53 47.79	2.2463	16 38 15.6	4.549
18	18 4 53.31	2.3704	18 25 33.5	0.171	18	19 56 2.45	2.2426	16 33 40.1	4.636
19	18 7 15.49	2.3690	18 25 40.5	-0.062	19	19 58 16.90	2.2390	16 28 59.3	4.722
20	18 9 37.59	2.3675	18 25 40.9	+0.048	20	20 0 31.13	2.2354	16 24 13.5	4.805
21	18 11 59.59	2.3660	18 25 34.7	0.158	21	20 2 45.15	2.2317	16 19 22.7	4.889
22	18 14 21.51	2.3644	18 25 21.9	0.267	22	20 4 58.93	2.2279	16 14 26.8	4.973
23	18 16 43.32	2.3627	18 25 2.6	0.376	23	20 7 12.50	2.2242	16 9 26.0	5.055
24	18 19 5.03	2.3610	-18 24 36.8	+0.484	24	20 9 25.84	2.2204	-16 4 20.2	+5.138

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 17.					JANUARY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 9 25.84	2.2204	-16 4 20.2	+5.138	0	21 51 33.95	2.0374	-10 39 13.1	+8.096
1	20 11 38.95	2.2167	15 59 9.6	5.218	1	21 53 36.09	2.0310	10 31 6.1	8.137
2	20 13 51.84	2.2129	15 53 54.1	5.298	2	21 55 38.03	2.0305	10 22 56.6	8.175
3	20 16 4.50	2.2091	15 48 33.9	5.376	3	21 57 39.75	2.0270	10 14 44.6	8.219
4	20 18 16.93	2.2052	15 43 9.0	5.454	4	21 59 41.27	2.0237	10 6 30.3	8.259
5	20 20 29.13	2.2013	15 37 39.4	5.532	5	22 1 42.59	2.0203	9 58 13.5	8.298
6	20 22 41.09	2.1975	15 32 5.1	5.609	6	22 3 43.71	2.0169	9 49 54.5	8.335
7	20 24 52.83	2.1937	15 26 26.3	5.685	7	22 5 44.62	2.0136	9 41 33.3	8.372
8	20 27 4.33	2.1898	15 20 42.9	5.761	8	22 7 45.34	2.0103	9 33 9.8	8.410
9	20 29 15.61	2.1859	15 14 55.0	5.835	9	22 9 45.86	2.0070	9 24 44.1	8.446
10	20 31 26.64	2.1820	15 9 2.7	5.908	10	22 11 46.18	2.0038	9 16 16.3	8.480
11	20 33 37.45	2.1782	15 3 6.0	5.981	11	22 13 46.31	2.0006	9 7 46.5	8.514
12	20 35 48.02	2.1743	14 57 5.0	6.053	12	22 15 46.25	1.9974	8 59 14.6	8.548
13	20 37 58.36	2.1703	14 50 59.7	6.124	13	22 17 46.00	1.9942	8 50 40.7	8.581
14	20 40 8.46	2.1663	14 44 50.1	6.194	14	22 19 45.56	1.9912	8 42 4.9	8.613
15	20 42 18.32	2.1624	14 38 36.4	6.263	15	22 21 44.94	1.9881	8 33 27.2	8.644
16	20 44 27.95	2.1586	14 32 18.5	6.332	16	22 23 44.13	1.9851	8 24 47.6	8.675
17	20 46 37.35	2.1547	14 25 56.5	6.401	17	22 25 43.15	1.9821	8 16 6.2	8.705
18	20 48 46.51	2.1508	14 19 30.4	6.468	18	22 27 41.98	1.9790	8 7 23.0	8.734
19	20 50 55.44	2.1468	14 13 0.4	6.533	19	22 29 40.63	1.9762	7 58 38.1	8.762
20	20 53 4.13	2.1429	14 6 26.4	6.599	20	22 31 39.12	1.9733	7 49 51.5	8.790
21	20 55 12.59	2.1390	13 59 48.5	6.663	21	22 33 37.42	1.9703	7 41 3.3	8.818
22	20 57 20.81	2.1350	13 53 6.8	6.727	22	22 35 35.56	1.9676	7 32 13.4	8.844
23	20 59 28.79	2.1311	-13 46 21.3	+6.790	23	22 37 33.53	1.9648	- 7 23 22.0	+8.869
JANUARY 18.					JANUARY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 1 36.54	2.1272	-13 39 32.0	+6.852	0	22 39 31.33	1.9620	- 7 14 29.1	+8.894
1	21 3 44.06	2.1233	13 32 39.0	6.913	1	22 41 28.97	1.9593	7 5 34.7	8.918
2	21 5 51.34	2.1194	13 25 42.4	6.973	2	22 43 26.45	1.9566	6 56 38.9	8.942
3	21 7 58.39	2.1156	13 18 42.2	7.033	3	22 45 23.76	1.9540	-6 47 41.6	8.966
4	21 10 5.21	2.1117	13 11 38.4	7.092	4	22 47 20.93	1.9514	6 38 43.0	8.988
5	21 12 11.79	2.1078	13 4 31.2	7.149	5	22 49 17.93	1.9488	6 29 43.1	9.009
6	21 14 18.15	2.1040	12 57 20.5	7.207	6	22 51 14.79	1.9463	6 20 41.9	9.030
7	21 16 24.27	2.1002	12 50 6.3	7.263	7	22 53 11.49	1.9438	6 11 39.5	9.051
8	21 18 30.17	2.0963	12 42 48.9	7.318	8	22 55 8.05	1.9414	6 2 35.8	9.071
9	21 20 35.83	2.0925	12 35 28.1	7.374	9	22 57 4.46	1.9391	5 53 31.0	9.089
10	21 22 41.27	2.0887	12 28 4.0	7.428	10	22 59 0.74	1.9367	5 44 25.1	9.107
11	21 24 46.48	2.0849	12 20 36.8	7.480	11	23 0 56.87	1.9343	5 35 18.1	9.125
12	21 26 51.46	2.0811	12 13 6.4	7.533	12	23 2 52.86	1.9321	5 26 10.1	9.142
13	21 28 56.21	2.0773	12 5 32.9	7.584	13	23 4 48.72	1.9298	5 17 1.1	9.158
14	21 31 0.74	2.0737	11 57 56.3	7.634	14	23 6 44.44	1.9277	5 7 51.1	9.174
15	21 33 5.05	2.0700	11 50 16.8	7.683	15	23 8 40.04	1.9255	4 58 40.2	9.189
16	21 35 9.14	2.0662	11 42 34.3	7.733	16	23 10 35.50	1.9234	4 49 28.4	9.204
17	21 37 13.00	2.0625	11 34 48.8	7.782	17	23 12 30.85	1.9214	4 40 15.7	9.218
18	21 39 16.64	2.0589	11 27 0.5	7.828	18	23 14 26.07	1.9193	4 31 2.2	9.232
19	21 41 20.07	2.0552	11 19 9.4	7.875	19	23 16 21.17	1.9173	4 21 47.9	9.244
20	21 43 23.27	2.0517	11 11 15.5	7.921	20	23 18 16.15	1.9155	4 12 32.9	9.256
21	21 45 26.27	2.0481	11 3 18.9	7.966	21	23 20 11.03	1.9137	4 3 17.2	9.268
22	21 47 29.04	2.0444	10 55 19.6	8.011	22	23 22 5.78	1.9118	3 54 0.8	9.278
23	21 49 31.60	2.0409	10 47 17.6	8.054	23	23 24 0.43	1.9099	3 44 43.8	9.288
24	21 51 33.95	2.0374	-10 39 13.1	+8.096	24	23 25 54.97	1.9082	- 3 35 26.2	+9.296

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.*	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 21.					JANUARY 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	23 25 54.97	1.9082	-3 35 26.2	+9.298	0	0 56 22.21	1.8791	+ 3 51 22.9	+9.115
1	23 27 49.41	1.9064	3 26 8.0	9.307	1	0 58 14.97	1.8796	4 0 29.3	9.098
2	23 29 43.74	1.9048	3 16 49.3	9.316	2	1 0 7.76	1.8802	4 9 34.7	9.082
3	23 31 37.98	1.9032	3 7 30.1	9.323	3	1 2 0.59	1.8808	4 18 39.1	9.064
4	23 33 32.12	1.9016	2 58 10.5	9.331	4	1 3 53.46	1.8816	4 27 42.4	9.046
5	23 35 26.17	1.9001	2 48 50.4	9.338	5	1 5 46.38	1.8824	4 36 44.6	9.027
6	23 37 20.13	1.8987	2 39 30.0	9.343	6	1 7 39.35	1.8832	4 45 45.7	9.008
7	23 39 14.01	1.8973	2 30 9.2	9.350	7	1 9 32.36	1.8840	4 54 45.6	8.989
8	23 41 7.80	1.8958	2 20 48.0	9.355	8	1 11 25.43	1.8849	5 3 44.4	8.969
9	23 43 1.50	1.8944	2 11 26.6	9.359	9	1 13 18.55	1.8858	5 12 41.9	8.948
10	23 44 55.13	1.8932	2 2 4.9	9.363	10	1 15 11.73	1.8868	5 21 38.2	8.927
11	23 46 48.68	1.8918	1 52 43.1	9.366	11	1 17 4.96	1.8878	5 30 33.2	8.906
12	23 48 42.15	1.8906	1 43 21.0	9.369	12	1 18 58.27	1.8890	5 39 26.9	8.883
13	23 50 35.55	1.8895	1 33 58.8	9.371	13	1 20 51.64	1.8901	5 48 19.2	8.861
14	23 52 28.89	1.8884	1 24 36.5	9.373	14	1 22 45.08	1.8912	5 57 10.2	8.838
15	23 54 22.16	1.8873	1 15 14.1	9.374	15	1 24 38.59	1.8924	6 5 59.8	8.814
16	23 56 15.37	1.8863	1 5 51.6	9.374	16	1 26 32.17	1.8937	6 14 47.9	8.790
17	23 58 8.52	1.8854	0 56 29.2	9.374	17	1 28 25.84	1.8951	6 23 34.6	8.766
18	0 0 1.62	1.8844	0 47 6.7	9.374	18	1 30 19.58	1.8964	6 32 19.8	8.741
19	0 1 54.65	1.8835	0 37 44.3	9.373	19	1 32 13.41	1.8979	6 41 3.5	8.715
20	0 3 47.64	1.8827	0 28 22.0	9.371	20	1 34 7.33	1.8993	6 49 45.6	8.689
21	0 5 40.58	1.8820	0 18 59.8	9.369	21	1 36 1.33	1.9008	6 58 26.2	8.662
22	0 7 33.48	1.8812	0 9 37.7	9.366	22	1 37 55.43	1.9024	7 7 5.1	8.635
23	0 9 26.33	1.8805	-0 0 15.9	+9.362	23	1 39 49.62	1.9040	+ 7 15 42.4	+8.607
JANUARY 22.					JANUARY 24.				
0	0 11 19.14	1.8798	+0 0 5.8	+9.359	0	1 41 43.91	1.9057	+ 7 24 18.0	+8.579
1	0 13 11.91	1.8793	0 18 27.2	9.355	1	1 43 38.30	1.9073	7 32 51.9	8.550
2	0 15 4.65	1.8788	0 27 48.4	9.351	2	1 45 32.79	1.9091	7 41 24.0	8.521
3	0 16 57.36	1.8783	0 37 9.3	9.345	3	1 47 27.39	1.9108	7 49 54.4	8.492
4	0 18 50.05	1.8778	0 46 29.8	9.339	4	1 49 22.09	1.9127	7 58 23.0	8.461
5	0 20 42.70	1.8774	0 55 50.0	9.333	5	1 51 16.91	1.9147	8 6 49.7	8.430
6	0 22 35.34	1.8771	1 5 9.8	9.326	6	1 53 11.85	1.9165	8 15 14.6	8.399
7	0 24 27.95	1.8768	1 14 29.1	9.318	7	1 55 6.89	1.9184	8 23 37.6	8.368
8	0 26 20.55	1.8765	1 23 48.0	9.311	8	1 57 2.06	1.9205	8 31 58.7	8.335
9	0 28 13.13	1.8763	1 33 6.4	9.303	9	1 58 57.35	1.9226	8 40 17.8	8.302
10	0 30 5.71	1.8762	1 42 24.3	9.294	10	2 0 52.77	1.9247	8 48 34.9	8.268
11	0 31 58.27	1.8760	1 51 41.7	9.284	11	2 2 48.31	1.9268	8 56 50.0	8.234
12	0 33 50.83	1.8760	2 0 58.4	9.273	12	2 4 43.98	1.9289	9 5 3.0	8.199
13	0 35 43.39	1.8760	2 10 14.5	9.261	13	2 6 39.78	1.9312	9 13 13.9	8.164
14	0 37 35.95	1.8760	2 19 30.1	9.253	14	2 8 35.72	1.9335	9 21 22.7	8.129
15	0 39 28.51	1.8761	2 28 44.9	9.241	15	2 10 31.80	1.9358	9 29 29.4	8.093
16	0 41 21.08	1.8762	2 37 59.0	9.228	16	2 12 28.02	1.9382	9 37 33.9	8.056
17	0 43 13.65	1.8764	2 47 12.3	9.217	17	2 14 24.38	1.9405	9 45 36.1	8.018
18	0 45 6.25	1.8767	2 56 25.0	9.204	18	2 16 20.88	1.9429	9 53 36.1	7.981
19	0 46 58.85	1.8768	3 5 36.8	9.190	19	2 18 17.53	1.9454	10 1 33.8	7.943
20	0 48 51.47	1.8772	3 14 47.8	9.176	20	2 20 14.33	1.9480	10 9 29.2	7.903
21	0 50 44.12	1.8777	3 23 57.9	9.162	21	2 22 11.29	1.9505	10 17 22.2	7.863
22	0 52 36.79	1.8780	3 33 7.2	9.147	22	2 24 8.39	1.9531	10 25 12.8	7.823
23	0 54 29.48	1.8785	3 42 15.5	9.131	23	2 26 5.66	1.9557	10 33 1.0	7.782
24	0 56 22.21	1.8791	+3 51 22.9	+9.115	24	2 28 3.08	1.9584	+10 40 46.7	+7.741

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 25.					JANUARY 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 28 3.08	1.9584	+10 40 46.7	+7.741	0	4 5 47.49	2.1245	+15 53 11.5	+5.029
1	2 30 0.67	1.9612	10 48 29.9	7.699	1	4 7 55.08	2.1285	15 58 11.1	4.957
2	2 31 58.42	1.9638	10 56 10.6	7.657	2	4 10 2.91	2.1326	16 3 6.3	4.883
3	2 33 56.33	1.9667	11 3 48.8	7.614	3	4 12 10.99	2.1366	16 7 57.0	4.808
4	2 35 54.42	1.9695	11 11 24.3	7.570	4	4 14 19.30	2.1405	16 12 43.3	4.734
5	2 37 52.67	1.9723	11 18 57.2	7.526	5	4 16 27.85	2.1446	16 17 25.1	4.658
6	2 39 51.10	1.9753	11 26 27.4	7.481	6	4 18 36.65	2.1486	16 22 2.3	4.582
7	2 41 49.71	1.9783	11 33 54.9	7.436	7	4 20 45.68	2.1526	16 26 35.0	4.506
8	2 43 48.49	1.9812	11 41 19.7	7.390	8	4 22 54.96	2.1567	16 31 3.0	4.428
9	2 45 47.45	1.9842	11 48 41.7	7.343	9	4 25 4.48	2.1607	16 35 26.3	4.349
10	2 47 46.60	1.9873	11 56 0.8	7.296	10	4 27 14.24	2.1647	16 39 44.9	4.271
11	2 49 45.93	1.9904	12 3 17.2	7.248	11	4 29 24.24	2.1687	16 43 58.8	4.192
12	2 51 45.45	1.9935	12 10 30.6	7.199	12	4 31 34.49	2.1728	16 48 7.9	4.111
13	2 53 45.15	1.9967	12 17 41.1	7.151	13	4 33 44.98	2.1768	16 52 12.1	4.030
14	2 55 45.05	1.9999	12 24 48.7	7.101	14	4 35 55.71	2.1808	16 56 11.5	3.948
15	2 57 45.14	2.0032	12 31 53.2	7.050	15	4 38 6.68	2.1848	17 0 5.9	3.866
16	2 59 45.43	2.0064	12 38 54.7	7.000	16	4 40 17.89	2.1889	17 3 55.4	3.783
17	3 1 45.91	2.0097	12 45 53.2	6.949	17	4 42 29.35	2.1929	17 7 39.8	3.698
18	3 3 46.59	2.0130	12 52 48.6	6.897	18	4 44 41.04	2.1968	17 11 19.2	3.614
19	3 5 47.47	2.0164	12 59 40.8	6.843	19	4 46 52.97	2.2009	17 14 53.5	3.529
20	3 7 48.56	2.0198	13 6 29.8	6.790	20	4 49 5.15	2.2049	17 18 22.7	3.443
21	3 9 49.85	2.0233	13 13 15.6	6.736	21	4 51 17.56	2.2088	17 21 46.7	3.357
22	3 11 51.35	2.0267	13 19 58.1	6.682	22	4 53 30.21	2.2128	17 25 5.6	3.270
23	3 13 53.05	2.0301	+13 26 37.4	+6.627	23	4 55 43.10	2.2168	+17 28 19.1	+3.182
JANUARY 26.					JANUARY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 15 54.96	2.0336	+13 33 13.3	+6.570	0	4 57 56.23	2.2207	+17 31 27.4	+3.094
1	3 17 57.08	2.0372	13 39 45.8	6.513	1	5 0 9.59	2.2247	17 34 30.4	3.005
2	3 19 59.42	2.0408	13 46 14.9	6.457	2	5 2 23.19	2.2286	17 37 28.0	2.915
3	3 22 1.97	2.0443	13 52 40.6	6.399	3	5 4 37.02	2.2325	17 40 20.2	2.824
4	3 24 4.73	2.0479	13 59 2.8	6.341	4	5 6 51.09	2.2363	17 43 6.9	2.733
5	3 26 7.72	2.0516	14 5 21.5	6.282	5	5 9 5.38	2.2402	17 45 48.2	2.642
6	3 28 10.92	2.0552	14 11 36.6	6.221	6	5 11 19.91	2.2440	17 48 23.9	2.549
7	3 30 14.34	2.0589	14 17 48.0	6.161	7	5 13 34.66	2.2478	17 50 54.1	2.457
8	3 32 17.99	2.0627	14 23 55.9	6.100	8	5 15 49.64	2.2516	17 53 18.8	2.363
9	3 34 21.86	2.0663	14 30 0.0	6.038	9	5 18 4.85	2.2554	17 55 37.7	2.268
10	3 36 25.96	2.0701	14 36 0.4	5.975	10	5 20 20.29	2.2592	17 57 51.0	2.174
11	3 38 30.27	2.0739	14 41 57.0	5.912	11	5 22 35.95	2.2628	17 59 58.6	2.079
12	3 40 34.82	2.0777	14 47 49.8	5.848	12	5 24 51.83	2.2665	18 2 0.5	1.983
13	3 42 39.59	2.0815	14 53 38.8	5.784	13	5 27 7.93	2.2702	18 3 56.6	1.887
14	3 44 44.60	2.0853	14 59 23.9	5.718	14	5 29 24.26	2.2739	18 5 46.9	1.790
15	3 46 49.83	2.0892	15 5 5.0	5.652	15	5 31 40.80	2.2775	18 7 31.4	1.692
16	3 48 55.30	2.0931	15 10 42.1	5.586	16	5 33 57.56	2.2811	18 9 9.9	1.593
17	3 51 1.00	2.0970	15 16 15.3	5.519	17	5 36 14.53	2.2846	18 10 42.6	1.495
18	3 53 6.94	2.1008	15 21 44.4	5.451	18	5 38 31.71	2.2881	18 12 9.3	1.395
19	3 55 13.10	2.1047	15 27 9.4	5.383	19	5 40 49.10	2.2916	18 13 30.0	1.295
20	3 57 19.51	2.1087	15 32 30.3	5.313	20	5 43 6.70	2.2951	18 14 44.7	1.195
21	3 59 26.15	2.1126	15 37 46.9	5.243	21	5 45 24.51	2.2985	18 15 53.4	1.094
22	4 1 33.02	2.1166	15 42 59.4	5.172	22	5 47 42.52	2.3018	18 16 56.0	0.992
23	4 3 40.14	2.1206	15 48 7.6	5.100	23	5 50 0.73	2.3052	18 17 52.5	0.890
24	4 5 47.49	2.1245	+15 53 11.5	+5.029	24	5 52 19.14	2.3085	+18 18 42.8	+0.788

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JANUARY 29.					JANUARY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 52 19.14	2.3085	+18 18 42.8	+0.788	0	7 46 0.75	2.4077	+16 51 56.4	-4.463
1	5 54 37.75	2.3118	18 19 27.0	0.684	1	7 48 25.23	2.4083	16 47 25.4	4.572
2	5 56 56.55	2.3150	18 20 4.9	0.581	2	7 50 49.75	2.4090	16 42 47.8	4.682
3	5 59 15.55	2.3182	18 20 36.7	0.478	3	7 53 14.31	2.4096	16 38 3.6	4.791
4	6 1 34.73	2.3213	18 21 2.2	0.373	4	7 55 38.90	2.4100	16 33 12.9	4.899
5	6 3 54.10	2.3244	18 21 21.4	0.267	5	7 58 3.51	2.4104	16 28 15.7	5.008
6	6 6 13.66	2.3274	18 21 34.3	0.162	6	8 0 28.15	2.4108	16 23 11.9	5.117
7	6 8 33.39	2.3304	18 21 40.9	+0.057	7	8 2 52.81	2.4112	16 18 1.7	5.223
8	6 10 53.31	2.3334	18 21 41.1	-0.049	8	8 5 17.49	2.4114	16 12 45.1	5.330
9	6 13 13.40	2.3363	18 21 35.0	0.156	9	8 7 42.18	2.4116	16 7 22.1	5.437
10	6 15 33.67	2.3392	18 21 22.4	0.263	10	8 10 6.88	2.4118	16 1 52.6	5.544
11	6 17 54.10	2.3420	18 21 3.4	0.370	11	8 12 31.60	2.4120	15 56 16.8	5.650
12	6 20 14.71	2.3448	18 20 38.0	0.478	12	8 14 56.32	2.4120	15 50 34.6	5.756
13	6 22 35.48	2.3475	18 20 6.1	0.586	13	8 17 21.04	2.4120	15 44 46.1	5.860
14	6 24 56.41	2.3502	18 19 27.7	0.694	14	8 19 45.76	2.4120	15 38 51.4	5.964
15	6 27 17.50	2.3528	18 18 42.8	0.803	15	8 22 10.48	2.4119	15 32 50.4	6.069
16	6 29 38.74	2.3553	18 17 51.4	0.912	16	8 24 35.19	2.4117	15 26 43.1	6.172
17	6 32 0.14	2.3579	18 16 53.4	1.021	17	8 26 59.89	2.4115	15 20 29.7	6.275
18	6 34 21.69	2.3603	18 15 48.9	1.131	18	8 29 24.57	2.4112	15 14 10.1	6.377
19	6 36 43.38	2.3627	18 14 37.7	1.241	19	8 31 49.24	2.4110	15 7 44.4	6.479
20	6 39 5.21	2.3650	18 13 20.0	1.350	20	8 34 13.89	2.4107	15 1 12.6	6.580
21	6 41 27.18	2.3673	18 11 55.7	1.460	21	8 36 38.53	2.4103	14 54 34.8	6.680
22	6 43 49.29	2.3697	18 10 24.8	1.571	22	8 39 3.13	2.4098	14 47 51.0	6.779
23	6 46 11.54	2.3718	+18 8 47.2	-1.682	23	8 41 27.71	2.4094	+14 41 1.3	-6.878
JANUARY 30.					FEBRUARY 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 48 33.91	2.3739	+18 7 3.0	-1.792	0	8 43 52.26	2.4089	+14 34 5.6	-6.978
1	6 50 56.41	2.3760	18 5 12.1	1.903	1	8 46 16.78	2.4083	14 27 4.0	7.075
2	6 53 19.03	2.3781	18 3 14.6	2.014	2	8 48 41.26	2.4077	14 19 56.6	7.172
3	6 55 41.78	2.3800	18 1 10.4	2.126	3	8 51 5.70	2.4070	14 12 43.4	7.268
4	6 58 4.63	2.3819	17 58 59.5	2.238	4	8 53 30.10	2.4064	14 5 24.5	7.362
5	7 0 27.61	2.3838	17 56 41.9	2.349	5	8 55 54.47	2.4057	13 57 59.8	7.458
6	7 2 50.69	2.3855	17 54 17.6	2.461	6	8 58 18.78	2.4048	13 50 29.5	7.552
7	7 5 13.87	2.3872	17 51 46.6	2.572	7	9 0 43.05	2.4041	13 42 53.6	7.644
8	7 7 37.16	2.3889	17 49 8.9	2.683	8	9 3 7.27	2.4033	13 35 12.2	7.736
9	7 10 0.54	2.3906	17 46 24.6	2.795	9	9 5 31.45	2.4024	13 27 25.3	7.828
10	7 12 24.03	2.3922	17 43 33.5	2.907	10	9 7 55.56	2.4015	13 19 32.9	7.918
11	7 14 47.60	2.3936	17 40 35.7	3.019	11	9 10 19.63	2.4006	13 11 35.1	8.008
12	7 17 11.26	2.3950	17 37 31.2	3.131	12	9 12 43.63	2.3996	13 3 32.0	8.096
13	7 19 35.00	2.3964	17 34 20.0	3.242	13	9 15 7.58	2.3986	12 55 23.6	8.184
14	7 21 58.83	2.3978	17 31 2.1	3.354	14	9 17 31.46	2.3975	12 47 9.9	8.271
15	7 24 22.73	2.3990	17 27 37.5	3.465	15	9 19 55.28	2.3965	12 38 51.1	8.356
16	7 26 46.71	2.4002	17 24 6.3	3.577	16	9 22 19.04	2.3954	12 30 27.2	8.441
17	7 29 10.75	2.4013	17 20 28.3	3.688	17	9 24 42.73	2.3943	12 21 58.2	8.525
18	7 31 34.87	2.4024	17 16 43.7	3.799	18	9 27 6.35	2.3932	12 13 24.2	8.608
19	7 33 59.04	2.4034	17 12 52.4	3.910	19	9 29 29.91	2.3920	12 4 45.3	8.690
20	7 36 23.28	2.4044	17 8 54.5	4.021	20	9 31 53.39	2.3908	11 56 1.4	8.771
21	7 38 47.57	2.4053	17 4 49.9	4.132	21	9 34 16.80	2.3896	11 47 12.8	8.850
22	7 41 11.92	2.4062	17 0 38.7	4.242	22	9 36 40.14	2.3883	11 38 19.4	8.929
23	7 43 36.31	2.4069	16 56 20.9	4.353	23	9 39 3.40	2.3871	11 29 21.3	9.007
24	7 46 0.75	2.4077	+16 51 56.4	-4.463	24	9 41 26.59	2.3858	+11 20 18.5	-9.085

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 2.					FEBRUARY 4.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	9 41 26.59	2.3858	+11 20 18.5	-9.085	0	11 34 21.55	2.3207	+2 58 9.9	-11.357
1	9 43 49.70	2.3845	11 11 11.1	9.160	1	11 36 40.76	2.3197	2 46 48.0	11.372
2	9 46 12.73	2.3832	11 1 59.3	9.234	2	11 38 59.91	2.3187	2 35 25.2	11.387
3	9 48 35.68	2.3818	10 52 43.0	9.308	3	11 41 19.00	2.3176	2 24 1.5	11.401
4	9 50 58.55	2.3805	10 43 22.3	9.380	4	11 43 38.02	2.3166	2 12 37.1	11.413
5	9 53 21.34	2.3792	10 33 57.4	9.451	5	11 45 56.99	2.3156	2 1 12.0	11.423
6	9 55 44.05	2.3778	10 24 28.2	9.522	6	11 48 15.89	2.3146	1 49 46.3	11.432
7	9 58 6.68	2.3764	10 14 54.8	9.591	7	11 50 34.74	2.3137	1 38 20.2	11.440
8	10 0 29.22	2.3750	10 5 17.3	9.658	8	11 52 53.54	2.3129	1 26 53.5	11.447
9	10 2 51.68	2.3736	9 55 35.8	9.725	9	11 55 12.29	2.3119	1 15 26.5	11.453
10	10 5 14.05	2.3722	9 45 50.3	9.791	10	11 57 30.97	2.3109	1 3 59.2	11.457
11	10 7 36.34	2.3707	9 36 0.9	9.856	11	11 59 49.60	2.3102	0 52 31.7	11.459
12	10 9 58.54	2.3692	9 26 7.6	9.919	12	12 2 8.19	2.3094	0 41 4.1	11.461
13	10 12 20.65	2.3678	9 16 10.6	9.981	13	12 4 26.73	2.3086	0 29 36.4	11.462
14	10 14 42.68	2.3665	9 6 9.9	10.042	14	12 6 45.22	2.3078	0 18 8.7	11.460
15	10 17 4.63	2.3650	8 56 5.6	10.100	15	12 9 3.67	2.3071	+0 6 41.2	11.457
16	10 19 26.48	2.3635	8 45 57.8	10.159	16	12 11 22.07	2.3063	-0 4 46.2	11.454
17	10 21 48.25	2.3621	8 35 46.5	10.217	17	12 13 40.43	2.3057	0 16 13.3	11.449
18	10 24 9.93	2.3607	8 25 31.8	10.273	18	12 15 58.76	2.3052	0 27 40.1	11.443
19	10 26 31.53	2.3592	8 15 13.7	10.328	19	12 18 17.05	2.3045	0 39 6.5	11.435
20	10 28 53.04	2.3577	8 4 52.4	10.381	20	12 20 35.30	2.3038	0 50 32.3	11.426
21	10 31 14.46	2.3562	7 54 23.0	10.432	21	12 22 53.51	2.3033	1 1 57.6	11.417
22	10 33 35.79	2.3548	7 44 0.5	10.484	22	12 25 11.69	2.3028	1 13 22.4	11.407
23	10 35 57.04	2.3534	+ 7 33 29.9	-10.534	23	12 27 29.84	2.3023	-1 24 46.4	-11.394
FEBRUARY 3.					FEBRUARY 5.				
0	10 38 18.20	2.3519	+ 7 22 56.4	-10.583	0	12 29 47.96	2.3018	-1 36 9.7	-11.381
1	10 40 39.27	2.3505	7 12 20.0	10.629	1	12 32 6.05	2.3013	1 47 32.1	11.365
2	10 43 0.26	2.3492	7 1 40.9	10.675	2	12 34 24.12	2.3009	1 58 53.5	11.349
3	10 45 21.17	2.3477	6 50 59.0	10.720	3	12 36 42.16	2.3005	2 10 14.0	11.332
4	10 47 41.98	2.3462	6 40 14.5	10.763	4	12 39 0.18	2.3001	2 21 33.3	11.313
5	10 50 2.71	2.3449	6 29 27.4	10.806	5	12 41 18.17	2.2997	2 32 51.5	11.293
6	10 52 23.37	2.3435	6 18 37.8	10.847	6	12 43 36.15	2.2995	2 44 8.5	11.272
7	10 54 43.93	2.3420	6 7 45.8	10.886	7	12 45 54.11	2.2993	2 55 24.2	11.250
8	10 57 4.41	2.3407	5 56 51.5	10.923	8	12 48 12.06	2.2990	3 6 38.5	11.227
9	10 59 24.81	2.3393	5 45 55.0	10.960	9	12 50 29.99	2.2987	3 17 51.4	11.202
10	11 1 45.13	2.3380	5 34 56.3	10.997	10	12 52 47.91	2.2986	3 29 2.7	11.176
11	11 4 5.37	2.3367	5 23 55.4	11.031	11	12 55 5.82	2.2984	3 40 12.5	11.148
12	11 6 25.53	2.3353	5 12 52.6	11.063	12	12 57 23.72	2.2983	3 51 20.6	11.121
13	11 8 45.61	2.3340	5 1 47.8	11.095	13	12 59 41.61	2.2982	4 2 27.0	11.092
14	11 11 5.61	2.3327	4 50 41.2	11.125	14	13 1 59.50	2.2981	4 13 31.6	11.061
15	11 13 25.53	2.3314	4 39 32.8	11.155	15	13 4 17.38	2.2981	4 24 34.3	11.029
16	11 15 45.38	2.3302	4 28 22.6	11.183	16	13 6 35.27	2.2981	4 35 35.1	10.997
17	11 18 5.15	2.3289	4 17 10.9	11.208	17	13 8 53.15	2.2980	4 46 33.9	10.963
18	11 20 24.85	2.3277	4 5 57.6	11.233	18	13 11 11.03	2.2980	4 57 30.6	10.927
19	11 22 44.48	2.3265	3 54 42.9	11.257	19	13 13 28.91	2.2981	5 8 25.1	10.891
20	11 25 4.03	2.3253	3 43 26.7	11.280	20	13 15 46.80	2.2982	5 19 17.5	10.854
21	11 27 23.51	2.3242	3 32 9.3	11.301	21	13 18 4.69	2.2983	5 30 7.6	10.815
22	11 29 42.93	2.3230	3 20 50.6	11.321	22	13 20 22.59	2.2985	5 40 55.3	10.775
23	11 32 2.27	2.3218	3 9 30.8	11.339	23	13 22 40.51	2.2987	5 51 40.6	10.734
24	11 34 21.55	2.3207	+ 2 58 9.9	-11.357	24	13 24 58.43	2.2988	-6 2 23.4	-10.693

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 6.					FEBRUARY 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 24 58.43	2.2988	- 6 2 23.4	-10.693	0	15 15 54.60	2.3282	-13 28 17.3	-7.538
1	13 27 16.36	2.2990	6 13 3.7	10.650	1	15 18 14.32	2.3291	13 35 47.0	7.452
2	13 29 34.31	2.2993	6 23 41.4	10.606	2	15 20 34.09	2.3298	13 43 11.5	7.366
3	13 31 52.28	2.2996	6 34 16.4	10.561	3	15 22 53.90	2.3306	13 50 30.9	7.278
4	13 34 10.26	2.2998	6 44 48.7	10.515	4	15 25 13.76	2.3314	13 57 44.9	7.189
5	13 36 28.26	2.3001	6 55 18.2	10.468	5	15 27 33.67	2.3322	14 4 53.6	7.101
6	13 38 46.27	2.3004	7 5 44.8	10.418	6	15 29 53.62	2.3328	14 11 57.0	7.012
7	13 41 4.31	2.3008	7 16 8.4	10.369	7	15 32 13.61	2.3336	14 18 55.0	6.921
8	13 43 22.37	2.3013	7 26 29.1	10.319	8	15 34 33.65	2.3343	14 25 47.5	6.831
9	13 45 40.46	2.3017	7 36 46.7	10.268	9	15 36 53.73	2.3350	14 32 34.7	6.740
10	13 47 58.57	2.3021	7 47 1.2	10.215	10	15 39 13.85	2.3357	14 39 16.3	6.648
11	13 50 16.71	2.3025	7 57 12.5	10.162	11	15 41 34.01	2.3363	14 45 52.4	6.555
12	13 52 34.87	2.3029	8 7 20.6	10.108	12	15 43 54.21	2.3370	14 52 22.9	6.462
13	13 54 53.06	2.3034	8 17 25.4	10.052	13	15 46 14.45	2.3377	14 58 47.9	6.369
14	13 57 11.28	2.3039	8 27 26.8	9.995	14	15 48 34.73	2.3383	15 5 7.2	6.274
15	13 59 29.53	2.3045	8 37 24.8	9.937	15	15 50 55.05	2.3389	15 11 20.8	6.180
16	14 1 47.82	2.3050	8 47 19.3	9.878	16	15 53 15.40	2.3395	15 17 28.8	6.085
17	14 4 6.13	2.3055	8 57 10.2	9.819	17	15 55 35.79	2.3401	15 23 31.0	5.989
18	14 6 24.48	2.3062	9 6 57.6	9.759	18	15 57 56.21	2.3406	15 29 27.5	5.893
19	14 8 42.87	2.3068	9 16 41.3	9.698	19	16 0 16.66	2.3412	15 35 18.2	5.796
20	14 11 1.29	2.3075	9 26 21.3	9.636	20	16 2 37.15	2.3417	15 41 3.0	5.698
21	14 13 19.75	2.3080	9 35 57.6	9.573	21	16 4 57.66	2.3421	15 46 42.0	5.602
22	14 15 38.25	2.3086	9 45 30.0	9.508	22	16 7 18.20	2.3426	15 52 15.2	5.504
23	14 17 56.78	2.3093	- 9 54 58.5	-9.443	23	16 9 38.77	2.3431	-15 57 42.5	-5.405
FEBRUARY 7.					FEBRUARY 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 20 15.36	2.3100	-10 4 23.1	-9.377	0	16 11 59.37	2.3435	-16 3 3.8	-5.306
1	14 22 33.98	2.3107	10 13 43.7	9.310	1	16 14 19.99	2.3438	16 8 19.2	5.207
2	14 24 52.64	2.3113	10 23 0.3	9.242	2	16 16 40.63	2.3443	16 13 28.6	5.107
3	14 27 11.34	2.3121	10 32 12.7	9.173	3	16 19 1.30	2.3447	16 18 32.0	5.006
4	14 29 30.09	2.3128	10 41 21.0	9.103	4	16 21 21.99	2.3449	16 23 29.3	4.905
5	14 31 48.88	2.3135	10 50 25.1	9.032	5	16 23 42.69	2.3452	16 28 20.6	4.804
6	14 34 7.71	2.3142	10 59 24.9	8.961	6	16 26 3.41	2.3454	16 33 5.8	4.703
7	14 36 26.58	2.3149	11 8 20.4	8.889	7	16 28 24.14	2.3457	16 37 45.0	4.602
8	14 38 45.50	2.3157	11 17 11.6	8.816	8	16 30 44.89	2.3459	16 42 18.0	4.499
9	14 41 4.47	2.3165	11 25 58.3	8.742	9	16 33 5.65	2.3460	16 46 44.9	4.397
10	14 43 23.48	2.3173	11 34 40.6	8.667	10	16 35 26.41	2.3462	16 51 5.6	4.293
11	14 45 42.54	2.3181	11 43 18.4	8.592	11	16 37 47.19	2.3463	16 55 20.1	4.191
12	14 48 1.65	2.3188	11 51 51.6	8.515	12	16 40 7.97	2.3463	16 59 28.5	4.088
13	14 50 20.80	2.3196	12 0 20.2	8.438	13	16 42 28.75	2.3464	17 3 30.7	3.984
14	14 52 40.00	2.3204	12 8 44.2	8.360	14	16 44 49.54	2.3464	17 7 26.6	3.880
15	14 54 59.25	2.3212	12 17 3.4	8.281	15	16 47 10.32	2.3463	17 11 16.3	3.776
16	14 57 18.54	2.3219	12 25 17.9	8.202	16	16 49 31.10	2.3464	17 14 59.7	3.671
17	14 59 37.88	2.3227	12 33 27.6	8.121	17	16 51 51.89	2.3463	17 18 36.8	3.567
18	15 1 57.27	2.3236	12 41 32.4	8.040	18	16 54 12.65	2.3460	17 22 7.7	3.462
19	15 4 16.71	2.3243	12 49 32.4	7.958	19	16 56 33.41	2.3459	17 25 32.3	3.357
20	15 6 36.19	2.3251	12 57 27.4	7.876	20	16 58 54.16	2.3457	17 28 50.5	3.252
21	15 8 55.72	2.3259	13 5 17.5	7.793	21	17 1 14.89	2.3454	17 32 2.5	3.147
22	15 11 15.30	2.3267	13 13 2.5	7.708	22	17 3 35.61	2.3452	17 35 8.1	3.041
23	15 13 34.93	2.3275	13 20 42.4	7.623	23	17 5 56.31	2.3448	17 38 7.4	2.935
24	15 15 54.60	2.3282	-13 28 17.3	-7.538	24	17 8 16.99	2.3445	-17 41 0.3	-2.829

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 10.					FEBRUARY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 8 16.99	2.3445	-17 41 0.3	-2.829	0	18 59 35.34	2.2769	-17 55 12.0	+2.171
1	17 10 37.65	2.3441	17 43 46.9	2.723	1	19 1 51.88	2.2744	17 52 58.8	2.269
2	17 12 58.28	2.3436	17 46 27.1	2.617	2	19 4 8.27	2.2720	17 50 39.7	2.366
3	17 15 18.88	2.3431	17 49 0.9	2.511	3	19 6 24.52	2.2696	17 48 14.9	2.463
4	17 17 39.45	2.3426	17 51 28.4	2.404	4	19 8 40.62	2.2670	17 45 44.2	2.559
5	17 19 59.99	2.3420	17 53 49.4	2.298	5	19 10 56.56	2.2644	17 43 7.8	2.654
6	17 22 20.49	2.3414	17 56 4.1	2.192	6	19 13 12.35	2.2619	17 40 25.7	2.749
7	17 24 40.96	2.3408	17 58 12.4	2.086	7	19 15 27.99	2.2593	17 37 37.9	2.843
8	17 27 1.39	2.3401	18 0 14.4	1.979	8	19 17 43.46	2.2566	17 34 44.5	2.937
9	17 29 21.77	2.3393	18 2 9.9	1.872	9	19 19 58.78	2.2539	17 31 45.4	3.032
10	17 31 42.11	2.3385	18 3 59.0	1.766	10	19 22 13.93	2.2512	17 28 40.7	3.125
11	17 34 2.39	2.3377	18 5 41.8	1.659	11	19 24 28.92	2.2484	17 25 30.4	3.217
12	17 36 22.63	2.3368	18 7 18.1	1.552	12	19 26 43.74	2.2456	17 22 14.6	3.309
13	17 38 42.81	2.3359	18 8 48.0	1.446	13	19 28 58.39	2.2428	17 18 53.3	3.401
14	17 41 2.94	2.3350	18 10 11.6	1.340	14	19 31 12.88	2.2401	17 15 26.5	3.492
15	17 43 23.01	2.3340	18 11 28.8	1.233	15	19 33 27.20	2.2372	17 11 54.3	3.582
16	17 45 43.02	2.3329	18 12 39.5	1.126	16	19 35 41.34	2.2342	17 8 16.7	3.672
17	17 48 2.96	2.3318	18 13 43.9	1.020	17	19 37 55.31	2.2313	17 4 33.7	3.761
18	17 50 22.84	2.3307	18 14 41.9	0.913	18	19 40 9.10	2.2284	17 0 45.4	3.850
19	17 52 42.65	2.3295	18 15 33.5	0.807	19	19 42 22.72	2.2255	16 56 51.7	3.937
20	17 55 2.38	2.3283	18 16 18.8	0.702	20	19 44 36.16	2.2225	16 52 52.9	4.024
21	17 57 22.05	2.3271	18 16 57.7	0.596	21	19 46 49.42	2.2194	16 48 48.8	4.112
22	17 59 41.63	2.3258	18 17 30.3	0.490	22	19 49 2.49	2.2164	16 44 39.5	4.198
23	18 2 1.14	2.3244	-18 17 56.5	-0.384	23	19 51 15.39	2.2134	-16 40 25.1	+4.283
FEBRUARY 11.					FEBRUARY 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 4 20.56	2.3230	-18 18 16.4	-0.279	0	19 53 28.10	2.2103	-16 36 5.5	+4.368
1	18 6 39.90	2.3216	18 18 30.0	0.173	1	19 55 40.63	2.2072	16 31 40.9	4.452
2	18 8 59.15	2.3201	18 18 37.2	-0.068	2	19 57 52.97	2.2041	16 27 11.2	4.536
3	18 11 18.31	2.3186	18 18 38.2	+0.036	3	20 0 5.12	2.2010	16 22 36.6	4.618
4	18 13 37.38	2.3170	18 18 32.9	0.141	4	20 2 17.09	2.1978	16 17 57.0	4.702
5	18 15 56.35	2.3154	18 18 21.3	0.246	5	20 4 28.86	2.1947	16 13 12.4	4.783
6	18 18 15.23	2.3137	18 18 3.4	0.350	6	20 6 40.45	2.1915	16 8 23.0	4.863
7	18 20 34.00	2.3120	18 17 39.3	0.453	7	20 8 51.84	2.1883	16 3 28.8	4.944
8	18 22 52.67	2.3103	18 17 9.0	0.557	8	20 11 3.04	2.1851	15 58 29.7	5.024
9	18 25 11.24	2.3085	18 16 32.5	0.660	9	20 13 14.05	2.1819	15 53 25.9	5.103
10	18 27 29.69	2.3067	18 15 49.8	0.763	10	20 15 24.87	2.1787	15 48 17.4	5.181
11	18 29 48.04	2.3048	18 15 0.9	0.867	11	20 17 35.49	2.1754	15 43 4.2	5.258
12	18 32 6.27	2.3029	18 14 5.8	0.969	12	20 19 45.92	2.1722	15 37 46.4	5.335
13	18 34 24.39	2.3010	18 13 4.6	1.071	13	20 21 56.15	2.1688	15 32 24.0	5.412
14	18 36 42.39	2.2989	18 11 57.3	1.172	14	20 24 6.18	2.1656	15 26 57.0	5.488
15	18 39 0.26	2.2969	18 10 43.9	1.274	15	20 26 16.02	2.1622	15 21 25.5	5.562
16	18 41 18.02	2.2949	18 9 24.4	1.376	16	20 28 25.65	2.1589	15 15 49.6	5.636
17	18 43 35.65	2.2928	18 7 58.8	1.478	17	20 30 35.09	2.1557	15 10 9.2	5.709
18	18 45 53.15	2.2906	18 6 27.1	1.578	18	20 32 44.33	2.1524	15 4 24.5	5.782
19	18 48 10.52	2.2884	18 4 49.5	1.677	19	20 34 53.38	2.1491	14 58 35.4	5.853
20	18 50 27.76	2.2862	18 3 5.9	1.777	20	20 37 2.22	2.1458	14 52 42.1	5.924
21	18 52 44.86	2.2839	18 1 16.3	1.876	21	20 39 10.87	2.1424	14 46 44.5	5.995
22	18 55 1.83	2.2816	17 59 20.8	1.975	22	20 41 19.31	2.1390	14 40 42.7	6.065
23	18 57 18.65	2.2793	17 57 19.3	2.073	23	20 43 27.55	2.1357	14 34 36.7	6.134
24	18 59 35.34	2.2769	-17 55 12.0	+2.171	24	20 45 35.60	2.1325	-14 28 26.6	+6.202

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 14.					FEBRUARY 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 45 35.60	2.1325	-14 28 26.6	+6.202	0	22 24 14.09	1.9833	-8 26 21.8	+8.596
1	20 47 43.45	2.1291	14 22 12.4	6.270	1	22 26 13.01	1.9807	8 17 45.1	8.628
2	20 49 51.09	2.1257	14 15 54.2	6.336	2	22 28 11.77	1.9780	8 9 6.5	8.659
3	20 51 58.53	2.1224	14 9 32.1	6.403	3	22 30 10.37	1.9754	8 0 26.0	8.689
4	20 54 5.78	2.1191	14 3 5.9	6.468	4	22 32 8.82	1.9729	7 51 43.8	8.718
5	20 56 12.82	2.1157	13 56 35.9	6.532	5	22 34 7.12	1.9704	7 42 59.8	8.748
6	20 58 19.66	2.1124	13 50 2.1	6.596	6	22 36 5.27	1.9679	7 34 14.0	8.777
7	21 0 26.31	2.1091	13 43 24.4	6.659	7	22 38 3.27	1.9654	7 25 26.6	8.803
8	21 2 32.75	2.1058	13 36 43.0	6.721	8	22 40 1.12	1.9630	7 16 37.6	8.830
9	21 4 39.00	2.1024	13 29 57.9	6.783	9	22 41 58.83	1.9606	7 7 47.0	8.856
10	21 6 45.04	2.0991	13 23 9.1	6.844	10	22 43 56.39	1.9583	6 58 54.9	8.882
11	21 8 50.89	2.0958	13 16 16.6	6.904	11	22 45 53.82	1.9559	6 50 1.2	8.907
12	21 10 56.54	2.0925	13 9 20.6	6.963	12	22 47 51.10	1.9536	6 41 6.1	8.930
13	21 13 1.99	2.0892	13 2 21.1	7.022	13	22 49 48.25	1.9513	6 32 9.6	8.953
14	21 15 7.24	2.0858	12 55 18.0	7.079	14	22 51 45.26	1.9490	6 23 11.7	8.977
15	21 17 12.29	2.0826	12 48 11.6	7.136	15	22 53 42.13	1.9468	6 14 12.4	8.998
16	21 19 17.15	2.0794	12 41 1.7	7.192	16	22 55 38.88	1.9447	6 5 11.9	9.019
17	21 21 21.82	2.0762	12 33 48.5	7.248	17	22 57 35.49	1.9425	5 56 10.1	9.040
18	21 23 26.29	2.0728	12 26 31.9	7.303	18	22 59 31.98	1.9404	5 47 7.1	9.060
19	21 25 30.56	2.0696	12 19 12.1	7.357	19	23 1 28.34	1.9383	5 38 2.9	9.079
20	21 27 34.64	2.0664	12 11 49.1	7.410	20	23 3 24.57	1.9363	5 28 57.6	9.097
21	21 29 38.53	2.0632	12 4 22.9	7.463	21	23 5 20.69	1.9343	5 19 51.2	9.115
22	21 31 42.22	2.0599	11 56 53.5	7.515	22	23 7 16.68	1.9323	5 10 43.8	9.132
23	21 33 45.72	2.0567	-11 49 21.1	+7.565	23	23 9 12.56	1.9303	-5 1 35.3	+9.149
FEBRUARY 15.					FEBRUARY 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 35 49.03	2.0536	-11 41 45.7	+7.615	0	23 11 8.32	1.9284	-4 52 25.9	+9.165
1	21 37 52.15	2.0504	11 34 7.3	7.665	1	23 13 3.97	1.9265	4 43 15.5	9.180
2	21 39 55.08	2.0473	11 26 25.9	7.713	2	23 14 59.50	1.9247	4 34 4.3	9.195
3	21 41 57.83	2.0442	11 18 41.7	7.762	3	23 16 54.93	1.9229	4 24 52.1	9.209
4	21 44 0.39	2.0411	11 10 54.5	7.809	4	23 18 50.25	1.9211	4 15 39.2	9.222
5	21 46 2.76	2.0379	11 3 4.6	7.855	5	23 20 45.46	1.9193	4 6 25.5	9.234
6	21 48 4.94	2.0348	10 55 11.9	7.901	6	23 22 40.57	1.9177	3 57 11.1	9.247
7	21 50 6.94	2.0318	10 47 16.5	7.946	7	23 24 35.58	1.9160	3 47 55.9	9.258
8	21 52 8.76	2.0288	10 39 18.4	7.990	8	23 26 30.49	1.9143	3 38 40.1	9.268
9	21 54 10.40	2.0258	10 31 17.7	8.034	9	23 28 25.30	1.9128	3 29 23.7	9.278
10	21 56 11.86	2.0228	10 23 14.3	8.077	10	23 30 20.02	1.9113	3 20 6.7	9.288
11	21 58 13.14	2.0198	10 15 8.5	8.118	11	23 32 14.65	1.9097	3 10 49.1	9.297
12	22 0 14.24	2.0169	10 7 0.2	8.159	12	23 34 9.18	1.9082	3 1 31.0	9.305
13	22 2 15.17	2.0139	9 58 49.4	8.199	13	23 36 3.63	1.9068	2 52 12.5	9.312
14	22 4 15.91	2.0110	9 50 36.3	8.239	14	23 37 57.99	1.9053	2 42 53.5	9.320
15	22 6 16.49	2.0082	9 42 20.7	8.278	15	23 39 52.27	1.9040	2 33 34.1	9.327
16	22 8 16.89	2.0053	9 34 2.9	8.317	16	23 41 46.47	1.9027	2 24 14.3	9.333
17	22 10 17.13	2.0025	9 25 42.7	8.354	17	23 43 40.59	1.9013	2 14 54.2	9.338
18	22 12 17.19	1.9996	9 17 20.4	8.391	18	23 45 34.63	1.9002	2 5 33.8	9.342
19	22 14 17.08	1.9968	9 8 55.8	8.428	19	23 47 28.61	1.8990	1 56 13.2	9.345
20	22 16 16.81	1.9942	9 0 29.1	8.463	20	23 49 22.51	1.8977	1 46 52.4	9.348
21	22 18 16.38	1.9914	8 52 0.3	8.497	21	23 51 16.33	1.8965	1 37 31.4	9.352
22	22 20 15.78	1.9886	8 43 29.5	8.531	22	23 53 10.09	1.8955	1 28 10.2	9.354
23	22 22 15.01	1.9859	8 34 56.6	8.564	23	23 55 3.79	1.8944	1 18 48.9	9.355
24	22 24 14.09	1.9833	-8 26 21.8	+8.596	24	23 56 57.42	1.8933	-1 9 27.6	+9.356

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 18.					FEBRUARY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 56 57.42	1.8933	-1 9 27.6	+9.356	0	1 27 25.19	1.8914	+ 6 9 57.4	+8.743
1	23 58 50.99	1.8924	1 0 6.2	9.357	1	1 29 18.70	1.8924	6 18 41.2	8.717
2	0 0 44.51	1.8915	0 50 44.8	9.357	2	1 31 12.28	1.8934	6 27 23.5	8.691
3	0 2 37.97	1.8906	0 41 23.4	9.356	3	1 33 5.91	1.8944	6 36 4.1	8.663
4	0 4 31.38	1.8897	0 32 2.1	9.354	4	1 34 59.61	1.8955	6 44 43.1	8.637
5	0 6 24.73	1.8888	0 22 40.9	9.352	5	1 36 53.37	1.8966	6 53 20.5	8.609
6	0 8 18.04	1.8881	0 13 19.9	9.349	6	1 38 47.20	1.8977	7 1 56.2	8.581
7	0 10 11.30	1.8873	-0 3 59.0	9.347	7	1 40 41.10	1.8990	7 10 30.2	8.552
8	0 12 4.52	1.8867	+0 5 21.7	9.343	8	1 42 35.08	1.9003	7 19 2.4	8.522
9	0 13 57.70	1.8859	0 14 42.1	9.338	9	1 44 29.13	1.9014	7 27 32.8	8.492
10	0 15 50.83	1.8853	0 24 2.3	9.334	10	1 46 23.25	1.9027	7 36 1.4	8.461
11	0 17 43.93	1.8848	0 33 22.2	9.328	11	1 48 17.46	1.9042	7 44 28.1	8.430
12	0 19 37.00	1.8842	0 42 41.7	9.322	12	1 50 11.75	1.9055	7 52 53.0	8.398
13	0 21 30.03	1.8837	0 52 0.8	9.315	13	1 52 6.12	1.9069	8 1 15.9	8.367
14	0 23 23.04	1.8832	1 1 19.5	9.308	14	1 54 0.58	1.9084	8 9 37.0	8.334
15	0 25 16.02	1.8827	1 10 37.8	9.301	15	1 55 55.13	1.9100	8 17 56.0	8.301
16	0 27 8.97	1.8824	1 19 55.6	9.293	16	1 57 49.78	1.9115	8 26 13.1	8.268
17	0 29 1.91	1.8820	1 29 12.9	9.283	17	1 59 44.51	1.9130	8 34 28.1	8.233
18	0 30 54.81	1.8817	1 38 29.6	9.274	18	2 1 39.34	1.9147	8 42 41.0	8.198
19	0 32 47.71	1.8816	1 47 45.8	9.265	19	2 3 34.27	1.9163	8 50 51.8	8.163
20	0 34 40.60	1.8813	1 57 1.4	9.254	20	2 5 29.30	1.9180	8 59 0.5	8.128
21	0 36 33.47	1.8810	2 6 16.3	9.243	21	2 7 24.43	1.9198	9 7 7.1	8.092
22	0 38 26.32	1.8808	2 15 30.5	9.231	22	2 9 19.67	1.9216	9 15 11.5	8.054
23	0 40 19.17	1.8808	+2 24 44.0	+9.219	23	2 11 15.02	1.9233	+ 9 23 13.6	+8.017
FEBRUARY 19.					FEBRUARY 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 42 12.02	1.8808	+2 33 56.8	+9.207	0	2 13 10.47	1.9252	+ 9 31 13.5	+7.979
1	0 44 4.86	1.8807	2 43 8.8	9.193	1	2 15 6.04	1.9271	9 39 11.1	7.941
2	0 45 57.71	1.8807	2 52 20.0	9.180	2	2 17 1.72	1.9289	9 47 6.4	7.902
3	0 47 50.55	1.8808	3 1 30.4	9.166	3	2 18 57.51	1.9309	9 54 59.3	7.862
4	0 49 43.40	1.8809	3 10 39.9	9.150	4	2 20 53.43	1.9330	10 2 49.8	7.822
5	0 51 36.26	1.8811	3 19 48.4	9.135	5	2 22 49.47	1.9350	10 10 37.9	7.782
6	0 53 29.13	1.8813	3 28 56.1	9.120	6	2 24 45.63	1.9370	10 18 23.6	7.741
7	0 55 22.01	1.8815	3 38 2.8	9.103	7	2 26 41.91	1.9392	10 26 6.8	7.699
8	0 57 14.91	1.8818	3 47 8.4	9.086	8	2 28 38.33	1.9413	10 33 47.5	7.657
9	0 59 7.82	1.8820	3 56 13.1	9.069	9	2 30 34.87	1.9434	10 41 25.6	7.613
10	1 1 0.75	1.8823	4 5 16.7	9.050	10	2 32 31.54	1.9457	10 49 1.1	7.571
11	1 2 53.70	1.8827	4 14 19.1	9.032	11	2 34 28.35	1.9479	10 56 34.1	7.528
12	1 4 46.68	1.8832	4 23 20.5	9.013	12	2 36 25.29	1.9502	11 4 4.4	7.483
13	1 6 39.68	1.8837	4 32 20.7	8.993	13	2 38 22.37	1.9525	11 11 32.1	7.438
14	1 8 32.72	1.8842	4 41 19.7	8.973	14	2 40 19.59	1.9548	11 18 57.0	7.393
15	1 10 25.78	1.8847	4 50 17.5	8.952	15	2 42 16.95	1.9572	11 26 19.2	7.348
16	1 12 18.88	1.8853	4 59 14.0	8.932	16	2 44 14.45	1.9597	11 33 38.7	7.301
17	1 14 12.02	1.8859	5 8 9.3	8.910	17	2 46 12.11	1.9622	11 40 55.3	7.253
18	1 16 5.19	1.8866	5 17 3.2	8.888	18	2 48 9.91	1.9645	11 48 9.1	7.207
19	1 17 58.41	1.8873	5 25 55.8	8.865	19	2 50 7.85	1.9670	11 55 20.1	7.158
20	1 19 51.67	1.8880	5 34 47.0	8.842	20	2 52 5.95	1.9697	12 2 28.1	7.109
21	1 21 44.97	1.8888	5 43 36.8	8.818	21	2 54 4.21	1.9723	12 9 33.2	7.060
22	1 23 38.33	1.8897	5 52 25.1	8.793	22	2 56 2.62	1.9748	12 16 35.3	7.011
23	1 25 31.73	1.8905	6 1 12.0	8.769	23	2 58 1.19	1.9775	12 23 34.5	6.961
24	1 27 25.19	1.8914	+6 9 57.4	+8.743	24	2 59 59.92	1.9802	+12 30 30.6	+6.909

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 22.					FEBRUARY 24.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 59 59.92	1.9802	+12 30 30.6	+6.909	0	4 38 36.85	2.1363	+16 52 46.6	+3.793
1	3 1 58.81	1.9828	12 37 23.6	6.858	1	4 40 45.14	2.1399	16 56 31.8	3.713
2	3 3 57.86	1.9856	12 44 13.6	6.807	2	4 42 53.64	2.1435	17 0 12.2	3.633
3	3 5 57.08	1.9884	12 51 0.4	6.753	3	4 45 2.36	2.1471	17 3 47.8	3.553
4	3 7 56.47	1.9912	12 57 44.0	6.701	4	4 47 11.29	2.1507	17 7 18.6	3.472
5	3 9 56.02	1.9939	13 4 24.5	6.648	5	4 49 20.45	2.1544	17 10 44.4	3.389
6	3 11 55.74	1.9968	13 11 1.7	6.593	6	4 51 29.82	2.1580	17 14 5.3	3.307
7	3 13 55.64	1.9997	13 17 35.7	6.538	7	4 53 39.41	2.1616	17 17 21.3	3.225
8	3 15 55.70	2.0026	13 24 6.3	6.483	8	4 55 49.21	2.1652	17 20 32.3	3.142
9	3 17 55.95	2.0056	13 30 33.6	6.428	9	4 57 59.23	2.1688	17 23 38.3	3.057
10	3 19 56.37	2.0085	13 36 57.6	6.371	10	5 0 9.47	2.1724	17 26 39.1	2.972
11	3 21 56.97	2.0115	13 43 18.1	6.313	11	5 2 19.92	2.1760	17 29 34.9	2.887
12	3 23 57.75	2.0145	13 49 35.2	6.256	12	5 4 30.59	2.1796	17 32 25.6	2.802
13	3 25 58.71	2.0176	13 55 48.8	6.198	13	5 6 41.47	2.1832	17 35 11.1	2.714
14	3 27 59.86	2.0207	14 1 59.0	6.140	14	5 8 52.58	2.1868	17 37 51.3	2.628
15	3 30 1.19	2.0237	14 8 5.6	6.080	15	5 11 3.89	2.1904	17 40 26.4	2.541
16	3 32 2.70	2.0268	14 14 8.6	6.020	16	5 13 15.43	2.1940	17 42 56.2	2.452
17	3 34 4.41	2.0300	14 20 8.0	5.959	17	5 15 27.17	2.1975	17 45 20.7	2.363
18	3 36 6.30	2.0331	14 26 3.7	5.898	18	5 17 39.13	2.2012	17 47 39.8	2.274
19	3 38 8.38	2.0363	14 31 55.8	5.837	19	5 19 51.31	2.2047	17 49 53.6	2.185
20	3 40 10.66	2.0396	14 37 44.2	5.775	20	5 22 3.69	2.2082	17 52 2.0	2.094
21	3 42 13.13	2.0428	14 43 28.8	5.712	21	5 24 16.29	2.2117	17 54 4.9	2.003
22	3 44 15.79	2.0460	14 49 9.6	5.648	22	5 26 29.10	2.2152	17 56 2.4	1.912
23	3 46 18.65	2.0493	+14 54 46.6	+5.585	23	5 28 42.12	2.2187	+17 57 54.3	+1.819
FEBRUARY 23.					FEBRUARY 25.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	3 48 21.71	2.0526	+15 0 19.8	+5.521	0	5 30 55.35	2.2222	+17 59 40.7	+1.728
1	3 50 24.96	2.0559	15 5 49.1	5.455	1	5 33 8.79	2.2257	18 1 21.6	1.634
2	3 52 28.42	2.0592	15 11 14.4	5.389	2	5 35 22.44	2.2292	18 2 56.8	1.541
3	3 54 32.07	2.0626	15 16 35.8	5.323	3	5 37 36.29	2.2326	18 4 26.5	1.447
4	3 56 35.93	2.0660	15 21 53.2	5.256	4	5 39 50.35	2.2361	18 5 50.4	1.352
5	3 58 39.99	2.0694	15 27 6.5	5.188	5	5 42 4.62	2.2395	18 7 8.7	1.257
6	4 0 44.26	2.0728	15 32 15.8	5.121	6	5 44 19.09	2.2428	18 8 21.2	1.161
7	4 2 48.73	2.0762	15 37 21.0	5.052	7	5 46 33.76	2.2462	18 9 28.0	1.065
8	4 4 53.40	2.0796	15 42 22.0	4.983	8	5 48 48.63	2.2496	18 10 29.0	0.968
9	4 6 58.28	2.0831	15 47 18.9	4.913	9	5 51 3.71	2.2529	18 11 24.2	0.871
10	4 9 3.37	2.0866	15 52 11.6	4.842	10	5 53 18.98	2.2562	18 12 13.5	0.773
11	4 11 8.67	2.0901	15 57 0.0	4.771	11	5 55 34.45	2.2595	18 12 57.0	0.676
12	4 13 14.18	2.0936	16 1 44.1	4.699	12	5 57 50.12	2.2628	18 13 34.6	0.578
13	4 15 19.90	2.0971	16 6 23.9	4.627	13	6 0 5.98	2.2660	18 14 6.3	0.478
14	4 17 25.83	2.1006	16 10 59.4	4.555	14	6 2 22.04	2.2692	18 14 32.0	0.378
15	4 19 31.97	2.1041	16 15 30.5	4.481	15	6 4 38.29	2.2724	18 14 51.7	0.279
16	4 21 38.32	2.1077	16 19 57.1	4.407	16	6 6 54.73	2.2756	18 15 5.5	0.179
17	4 23 44.89	2.1113	16 24 19.3	4.333	17	6 9 11.36	2.2787	18 15 13.2	+0.078
18	4 25 51.67	2.1148	16 28 37.0	4.257	18	6 11 28.17	2.2818	18 15 14.8	-0.024
19	4 27 58.66	2.1183	16 32 50.1	4.181	19	6 13 45.17	2.2849	18 15 10.3	0.125
20	4 30 5.87	2.1219	16 36 58.7	4.105	20	6 16 2.36	2.2880	18 14 59.8	0.227
21	4 32 13.29	2.1255	16 41 2.7	4.028	21	6 18 19.73	2.2909	18 14 43.1	0.329
22	4 34 20.93	2.1291	16 45 2.0	3.949	22	6 20 37.27	2.2939	18 14 20.3	0.432
23	4 36 28.78	2.1327	16 48 56.6	3.872	23	6 22 55.00	2.2969	18 13 51.3	0.535
24	4 38 36.85	2.1363	+16 52 46.6	+3.793	24	6 25 12.90	2.2998	+18 13 16.1	-0.638

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
FEBRUARY 26.					FEBRUARY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 25 12.90	2.2998	+18 13 16.1	-0.638	0	8 18 15.74	2.3947	+15 39 22.3	-5.789
1	6 27 30.98	2.3027	18 12 34.7	0.742	1	8 20 39.45	2.3956	15 33 31.8	5.894
2	6 29 49.23	2.3056	18 11 47.0	0.847	2	8 23 3.21	2.3964	15 27 35.0	5.999
3	6 32 7.65	2.3084	18 10 53.1	0.951	3	8 25 27.02	2.3973	15 21 31.9	6.103
4	6 34 26.24	2.3112	18 9 52.9	1.056	4	8 27 50.88	2.3981	15 15 22.6	6.207
5	6 36 44.99	2.3139	18 8 46.4	1.161	5	8 30 14.79	2.3989	15 9 7.1	6.311
6	6 39 3.91	2.3167	18 7 33.6	1.266	6	8 32 38.75	2.3997	15 2 45.3	6.414
7	6 41 22.99	2.3193	18 6 14.5	1.372	7	8 35 2.75	2.4004	14 56 17.4	6.516
8	6 43 42.23	2.3220	18 4 49.0	1.478	8	8 37 26.80	2.4011	14 49 43.4	6.618
9	6 46 1.63	2.3247	18 3 17.1	1.585	9	8 39 50.88	2.4017	14 43 3.3	6.720
10	6 48 21.19	2.3273	18 1 38.8	1.691	10	8 42 15.00	2.4023	14 36 17.0	6.821
11	6 50 40.90	2.3298	17 59 54.2	1.797	11	8 44 39.15	2.4028	14 29 24.8	6.921
12	6 53 0.76	2.3323	17 58 3.1	1.905	12	8 47 3.34	2.4034	14 22 26.5	7.021
13	6 55 20.77	2.3348	17 56 5.6	2.012	13	8 49 27.56	2.4038	14 15 22.3	7.120
14	6 57 40.93	2.3372	17 54 1.7	2.119	14	8 51 51.80	2.4042	14 8 12.1	7.220
15	7 0 1.23	2.3395	17 51 51.3	2.227	15	8 54 16.07	2.4047	14 0 55.9	7.318
16	7 2 21.67	2.3418	17 49 34.5	2.335	16	8 56 40.36	2.4051	13 53 33.9	7.415
17	7 4 42.25	2.3442	17 47 11.1	2.443	17	8 59 4.68	2.4054	13 46 6.1	7.512
18	7 7 2.97	2.3465	17 44 41.3	2.550	18	9 1 29.01	2.4057	13 38 32.5	7.608
19	7 9 23.83	2.3487	17 42 5.1	2.658	19	9 3 53.36	2.4060	13 30 53.2	7.703
20	7 11 44.81	2.3508	17 39 22.3	2.767	20	9 6 17.73	2.4063	13 23 8.1	7.798
21	7 14 5.93	2.3531	17 36 33.0	2.876	21	9 8 42.11	2.4065	13 15 17.4	7.892
22	7 16 27.18	2.3552	17 33 37.2	2.984	22	9 11 6.51	2.4067	13 7 21.1	7.985
23	7 18 48.55	2.3572	+17 30 34.9	-3.093	23	9 13 30.91	2.4068	+12 59 19.2	-8.078
FEBRUARY 27.					MARCH 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 21 10.04	2.3592	+17 27 26.0	-3.203	0	9 15 55.32	2.4069	+12 51 11.7	-8.170
1	7 23 31.65	2.3611	17 24 10.6	3.311	1	9 18 19.74	2.4070	12 42 58.8	8.261
2	7 25 53.37	2.3630	17 20 48.7	3.419	2	9 20 44.16	2.4070	12 34 40.4	8.351
3	7 28 15.21	2.3650	17 17 20.3	3.528	3	9 23 8.58	2.4071	12 26 16.7	8.440
4	7 30 37.17	2.3668	17 13 45.3	3.637	4	9 25 33.01	2.4071	12-17 47.6	8.529
5	7 32 59.23	2.3686	17 10 3.8	3.746	5	9 27 57.43	2.4070	12 9 13.2	8.617
6	7 35 21.40	2.3703	17 6 15.8	3.854	6	9 30 21.85	2.4071	12 0 33.6	8.703
7	7 37 43.67	2.3721	17 2 21.3	3.963	7	9 32 46.28	2.4071	11 51 48.9	8.789
8	7 40 6.05	2.3738	16 58 20.2	4.073	8	9 35 10.70	2.4069	11 42 58.9	8.874
9	7 42 28.52	2.3753	16 54 12.6	4.181	9	9 37 35.11	2.4068	11 34 4.0	8.958
10	7 44 51.09	2.3769	16 49 58.5	4.290	10	9 39 59.52	2.4067	11 25 4.0	9.041
11	7 47 13.75	2.3785	16 45 37.8	4.398	11	9 42 23.91	2.4065	11 15 59.1	9.122
12	7 49 36.51	2.3800	16 41 10.7	4.506	12	9 44 48.30	2.4063	11 6 49.3	9.203
13	7 51 59.35	2.3814	16 36 37.1	4.614	13	9 47 12.67	2.4061	10 57 34.7	9.284
14	7 54 22.28	2.3829	16 31 57.0	4.722	14	9 49 37.03	2.4059	10 48 15.2	9.363
15	7 56 45.30	2.3843	16 27 10.5	4.829	15	9 52 1.38	2.4057	10 38 51.1	9.441
16	7 59 8.39	2.3856	16 22 17.5	4.938	16	9 54 25.71	2.4055	10 29 22.3	9.518
17	8 1 31.57	2.3868	16 17 18.0	5.045	17	9 56 50.04	2.4052	10 19 48.9	9.594
18	8 3 54.81	2.3880	16 12 12.1	5.152	18	9 59 14.34	2.4049	10 10 11.0	9.668
19	8 6 18.13	2.3892	16 6 59.7	5.259	19	10 1 38.63	2.4047	10 0 28.7	9.742
20	8 8 41.52	2.3904	16 1 41.0	5.365	20	10 4 2.90	2.4043	9 50 41.9	9.815
21	8 11 4.98	2.3916	15 56 15.9	5.472	21	10 6 27.15	2.4039	9 40 50.9	9.887
22	8 13 28.51	2.3926	15 50 44.4	5.578	22	10 8 51.37	2.4036	9 30 55.5	9.958
23	8 15 52.09	2.3936	15 45 6.5	5.684	23	10 11 15.58	2.4032	9 20 56.0	10.026
24	8 18 15.74	2.3947	+15 39 22.3	-5.789	24	10 13 39.76	2.4028	+9 10 52.4	-10.094

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 2.					MARCH 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 13 39.76	2.4028	+9 10 52.4	-10.094	0	12 8 31.04	2.3842	+0 12 46.4	-11.787
1	10 16 3.92	2.4025	9 0 44.7	10.161	1	12 10 54.09	2.3840	+0 0 59.2	11.787
2	10 18 28.06	2.4022	8 50 33.1	10.227	2	12 13 17.12	2.3838	-0 10 48.0	11.785
3	10 20 52.18	2.4018	8 40 17.5	10.291	3	12 15 40.14	2.3836	0 22 35.0	11.781
4	10 23 16.28	2.4014	8 29 58.2	10.354	4	12 18 3.15	2.3834	0 34 21.7	11.777
5	10 25 40.35	2.4009	8 19 35.0	10.417	5	12 20 26.15	2.3832	0 46 8.2	11.771
6	10 28 4.39	2.4005	8 9 8.2	10.478	6	12 22 49.13	2.3830	0 57 54.2	11.763
7	10 30 28.41	2.4001	7 58 37.7	10.537	7	12 25 12.11	2.3830	1 9 39.7	11.754
8	10 32 52.40	2.3997	7 48 3.8	10.594	8	12 27 35.09	2.3829	1 21 24.7	11.743
9	10 35 16.37	2.3993	7 37 26.4	10.652	9	12 29 58.06	2.3828	1 33 8.9	11.731
10	10 37 40.31	2.3988	7 26 45.5	10.708	10	12 32 21.02	2.3827	1 44 52.4	11.718
11	10 40 4.22	2.3983	7 16 1.4	10.762	11	12 34 43.98	2.3826	1 56 35.1	11.703
12	10 42 28.11	2.3979	7 5 14.1	10.815	12	12 37 6.93	2.3825	2 8 16.8	11.687
13	10 44 51.97	2.3974	6 54 23.6	10.867	13	12 39 29.88	2.3825	2 19 57.5	11.669
14	10 47 15.80	2.3969	6 43 30.1	10.917	14	12 41 52.83	2.3825	2 31 37.1	11.649
15	10 49 39.60	2.3965	6 32 33.6	10.967	15	12 44 15.78	2.3824	2 43 15.4	11.628
16	10 52 3.38	2.3960	6 21 34.1	11.011	16	12 46 38.72	2.3823	2 54 52.5	11.607
17	10 54 27.12	2.3955	6 10 31.9	11.060	17	12 49 1.67	2.3822	3 6 28.2	11.583
18	10 56 50.84	2.3952	5 59 26.9	11.106	18	12 51 24.61	2.3821	3 18 2.4	11.558
19	10 59 14.54	2.3947	5 48 19.2	11.149	19	12 53 47.56	2.3825	3 29 35.1	11.531
20	11 1 38.20	2.3942	5 37 9.0	11.191	20	12 56 10.51	2.3826	3 41 6.1	11.503
21	11 4 1.84	2.3938	5 25 56.3	11.232	21	12 58 33.47	2.3827	3 52 35.5	11.474
22	11 6 25.45	2.3933	5 14 41.1	11.272	22	13 0 56.43	2.3828	4 4 3.0	11.443
23	11 8 49.03	2.3928	+5 3 23.7	-11.309	23	13 3 19.40	2.3828	-4 15 28.7	-11.412
MARCH 3.					MARCH 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 11 12.59	2.3924	+4 52 4.0	-11.346	0	13 5 42.37	2.3828	-4 26 52.4	-11.378
1	11 13 36.12	2.3919	4 40 42.2	11.381	1	13 8 5.34	2.3829	4 38 14.1	11.343
2	11 15 59.62	2.3915	4 29 18.3	11.415	2	13 10 28.32	2.3831	4 49 33.6	11.307
3	11 18 23.10	2.3912	4 17 52.4	11.448	3	13 12 51.31	2.3832	5 0 50.9	11.269
4	11 20 46.56	2.3908	4 6 24.6	11.478	4	13 15 14.31	2.3834	5 12 5.9	11.230
5	11 23 9.99	2.3903	3 54 55.0	11.507	5	13 17 37.32	2.3835	5 23 18.5	11.190
6	11 25 33.39	2.3898	3 43 23.7	11.535	6	13 20 0.33	2.3837	5 34 28.7	11.149
7	11 27 56.77	2.3895	3 31 50.8	11.562	7	13 22 23.36	2.3839	5 45 36.4	11.106
8	11 30 20.13	2.3891	3 20 16.3	11.587	8	13 24 46.40	2.3841	5 56 41.4	11.061
9	11 32 43.46	2.3887	3 8 40.4	11.610	9	13 27 9.45	2.3843	6 7 43.7	11.016
10	11 35 6.77	2.3883	2 57 3.1	11.632	10	13 29 32.51	2.3845	6 18 43.3	10.969
11	11 37 30.06	2.3879	2 45 24.5	11.653	11	13 31 55.59	2.3847	6 29 40.0	10.921
12	11 39 53.32	2.3875	2 33 44.7	11.672	12	13 34 18.67	2.3848	6 40 33.8	10.872
13	11 42 16.56	2.3873	2 22 3.8	11.690	13	13 36 41.77	2.3851	6 51 24.6	10.821
14	11 44 39.79	2.3869	2 10 21.9	11.707	14	13 39 4.88	2.3853	7 2 12.3	10.769
15	11 47 2.99	2.3866	1 58 39.0	11.722	15	13 41 28.01	2.3857	7 12 56.9	10.716
16	11 49 26.18	2.3863	1 46 55.3	11.734	16	13 43 51.16	2.3858	7 23 38.2	10.661
17	11 51 49.34	2.3859	1 35 10.9	11.746	17	13 46 14.31	2.3861	7 34 16.2	10.606
18	11 54 12.49	2.3857	1 23 25.8	11.757	18	13 48 37.49	2.3864	7 44 50.9	10.549
19	11 56 35.62	2.3854	1 11 40.1	11.765	19	13 51 0.68	2.3866	7 55 22.1	10.491
20	11 58 58.74	2.3852	0 59 54.0	11.772	20	13 53 23.88	2.3868	8 5 49.8	10.432
21	12 1 21.84	2.3848	0 48 7.5	11.778	21	13 55 47.10	2.3872	8 16 13.9	10.371
22	12 3 44.92	2.3846	0 36 20.6	11.782	22	13 58 10.34	2.3875	8 26 34.3	10.309
23	12 6 7.99	2.3843	0 24 33.6	11.785	23	14 0 33.60	2.3877	8 36 51.0	10.247
24	12 8 31.04	2.3842	+0 12 46.4	-11.787	24	14 2 56.87	2.3880	-8 47 3.9	-10.183

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 6.					MARCH 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 2 56.87	2.3880	- 8 47 3.9	-10.183	0	15 57 48.50	2.3928	-15 23 43.9	-6.038
1	14 5 20.16	2.3883	8 57 12.9	10.117	1	16 0 12.06	2.3926	15 29 43.1	5.936
2	14 7 43.47	2.3886	9 7 18.0	10.052	2	16 2 35.61	2.3922	15 35 36.2	5.833
3	14 10 6.79	2.3888	9 17 19.1	9.984	3	16 4 59.12	2.3917	15 41 23.1	5.729
4	14 12 30.13	2.3892	9 27 16.1	9.916	4	16 7 22.61	2.3913	15 47 3.7	5.624
5	14 14 53.49	2.3895	9 37 9.0	9.847	5	16 9 46.08	2.3909	15 52 38.0	5.520
6	14 17 16.87	2.3897	9 46 57.7	9.777	6	16 12 9.52	2.3903	15 58 6.1	5.416
7	14 19 40.26	2.3900	9 56 42.2	9.705	7	16 14 32.92	2.3898	16 3 27.9	5.311
8	14 22 3.67	2.3903	10 6 22.3	9.632	8	16 16 56.30	2.3893	16 8 43.4	5.205
9	14 24 27.10	2.3907	10 15 58.0	9.558	9	16 19 19.64	2.3887	16 13 52.5	5.099
10	14 26 50.55	2.3909	10 25 29.3	9.484	10	16 21 42.94	2.3881	16 18 55.3	4.993
11	14 29 14.01	2.3912	10 34 56.1	9.408	11	16 24 6.21	2.3874	16 23 51.7	4.887
12	14 31 37.49	2.3915	10 44 18.3	9.332	12	16 26 29.43	2.3867	16 28 41.7	4.780
13	14 34 0.99	2.3917	10 53 35.9	9.254	13	16 28 52.61	2.3860	16 33 25.3	4.673
14	14 36 24.50	2.3920	11 2 48.8	9.175	14	16 31 15.75	2.3853	16 38 2.5	4.567
15	14 38 48.03	2.3923	11 11 56.9	9.096	15	16 33 38.85	2.3845	16 42 33.3	4.459
16	14 41 11.57	2.3925	11 21 0.3	9.016	16	16 36 1.89	2.3837	16 46 57.6	4.352
17	14 43 35.13	2.3927	11 29 58.8	8.933	17	16 38 24.89	2.3828	16 51 15.5	4.243
18	14 45 58.70	2.3929	11 38 52.3	8.852	18	16 40 47.83	2.3818	16 55 26.8	4.135
19	14 48 22.28	2.3932	11 47 41.0	8.769	19	16 43 10.71	2.3809	16 59 31.7	4.028
20	14 50 45.88	2.3934	11 56 24.6	8.684	20	16 45 33.54	2.3800	17 3 30.2	3.920
21	14 53 9.49	2.3936	12 5 3.1	8.600	21	16 47 56.31	2.3790	17 7 22.1	3.811
22	14 55 33.11	2.3938	12 13 36.6	8.515	22	16 50 19.02	2.3780	17 11 7.5	3.702
23	14 57 56.75	2.3940	-12 22 4.9	-8.428	23	16 52 41.67	2.3769	-17 14 46.4	-3.593
MARCH 7.					MARCH 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 0 20.39	2.3942	-12 30 27.9	-8.340	0	16 55 4.25	2.3758	-17 18 18.7	-3.484
1	15 2 44.05	2.3943	12 38 45.7	8.252	1	16 57 26.76	2.3747	17 21 44.5	3.376
2	15 5 7.71	2.3944	12 46 58.1	8.163	2	16 59 49.21	2.3735	17 25 3.8	3.268
3	15 7 31.38	2.3946	12 55 5.2	8.073	3	17 2 11.58	2.3722	17 28 16.6	3.159
4	15 9 55.06	2.3948	13 3 6.9	7.983	4	17 4 33.87	2.3710	17 31 22.9	3.050
5	15 12 18.75	2.3949	13 11 3.2	7.892	5	17 6 56.10	2.3697	17 34 22.6	2.940
6	15 14 42.45	2.3949	13 18 54.0	7.800	6	17 9 18.24	2.3683	17 37 15.7	2.832
7	15 17 6.14	2.3949	13 26 39.2	7.707	7	17 11 40.30	2.3669	17 40 2.4	2.723
8	15 19 29.84	2.3950	13 34 18.9	7.614	8	17 14 2.27	2.3656	17 42 42.5	2.613
9	15 21 53.54	2.3951	13 41 52.9	7.520	9	17 16 24.17	2.3642	17 45 16.0	2.504
10	15 24 17.25	2.3951	13 49 21.3	7.426	10	17 18 45.97	2.3626	17 47 43.0	2.396
11	15 26 40.95	2.3950	13 56 44.0	7.330	11	17 21 7.68	2.3611	17 50 3.5	2.287
12	15 29 4.65	2.3950	14 4 0.9	7.234	12	17 23 29.30	2.3595	17 52 17.4	2.178
13	15 31 28.35	2.3950	14 11 12.1	7.137	13	17 25 50.82	2.3579	17 54 24.8	2.069
14	15 33 52.05	2.3949	14 18 17.4	7.040	14	17 28 12.25	2.3563	17 56 25.7	1.961
15	15 36 15.74	2.3948	14 25 16.9	6.943	15	17 30 33.58	2.3547	17 58 20.1	1.852
16	15 38 39.42	2.3947	14 32 10.6	6.845	16	17 32 54.81	2.3529	18 0 7.9	1.743
17	15 41 3.10	2.3946	14 38 58.3	6.745	17	17 35 15.93	2.3512	18 1 49.3	1.636
18	15 43 26.77	2.3944	14 45 40.0	6.646	18	17 37 36.95	2.3494	18 3 24.2	1.528
19	15 45 50.43	2.3942	14 52 15.8	6.545	19	17 39 57.86	2.3476	18 4 52.6	1.419
20	15 48 14.07	2.3939	14 58 45.6	6.446	20	17 42 18.66	2.3457	18 6 14.5	1.311
21	15 50 37.70	2.3937	15 5 9.3	6.345	21	17 44 39.34	2.3438	18 7 29.9	1.203
22	15 53 1.32	2.3935	15 11 27.0	6.243	22	17 46 59.91	2.3418	18 8 38.9	1.097
23	15 55 24.92	2.3932	15 17 38.5	6.141	23	17 49 20.36	2.3399	18 9 41.5	0.989
24	15 57 48.50	2.3928	-15 23 43.9	-6.038	24	17 51 40.70	2.3379	-18 10 37.6	-0.882

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 10.					MARCH 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 51 40.70	2.3379	-18 10 37.6	-0.882	0	19 40 58.25	2.2060	-16 56 6.9	+3.814
1	17 54 0.91	2.3358	18 11 27.3	0.775	1	19 43 10.51	2.2028	16 52 15.5	3.900
2	17 56 21.00	2.3337	18 12 10.6	0.668	2	19 45 22.59	2.1996	16 48 18.9	3.985
3	17 58 40.96	2.3316	18 12 47.5	0.562	3	19 47 34.46	2.1962	16 44 17.3	4.068
4	18 1 0.79	2.3294	18 13 18.0	0.456	4	19 49 46.13	2.1929	16 40 10.7	4.152
5	18 3 20.49	2.3272	18 13 42.2	0.350	5	19 51 57.61	2.1897	16 35 59.0	4.236
6	18 5 40.06	2.3250	18 14 0.0	0.244	6	19 54 8.89	2.1864	16 31 42.4	4.318
7	18 7 59.49	2.3228	18 14 11.5	0.139	7	19 56 19.98	2.1831	16 27 20.9	4.399
8	18 10 18.79	2.3205	18 14 16.7	-0.035	8	19 58 30.86	2.1797	16 22 54.5	4.481
9	18 12 37.95	2.3182	18 14 15.7	+0.070	9	20 0 41.54	2.1764	16 18 23.2	4.561
10	18 14 56.97	2.3158	18 14 8.3	0.175	10	20 2 52.03	2.1731	16 13 47.2	4.640
11	18 17 15.85	2.3134	18 13 54.7	0.278	11	20 5 2.31	2.1697	16 9 6.4	4.720
12	18 19 34.58	2.3110	18 13 34.9	0.382	12	20 7 12.39	2.1663	16 4 20.8	4.798
13	18 21 53.17	2.3086	18 13 8.9	0.485	13	20 9 22.27	2.1630	15 59 30.6	4.876
14	18 24 11.61	2.3060	18 12 36.7	0.588	14	20 11 31.95	2.1597	15 54 35.7	4.953
15	18 26 29.89	2.3034	18 11 58.3	0.692	15	20 13 41.43	2.1563	15 49 36.2	5.030
16	18 28 48.02	2.3009	18 11 13.7	0.793	16	20 15 50.71	2.1530	15 44 32.1	5.106
17	18 31 6.00	2.2983	18 10 23.1	0.894	17	20 17 59.79	2.1497	15 39 23.5	5.181
18	18 33 23.82	2.2957	18 9 26.4	0.996	18	20 20 8.67	2.1463	15 34 10.4	5.256
19	18 35 41.49	2.2931	18 8 23.6	1.097	19	20 22 17.34	2.1429	15 28 52.8	5.330
20	18 37 58.99	2.2904	18 7 14.7	1.198	20	20 24 25.82	2.1397	15 23 30.8	5.402
21	18 40 16.34	2.2877	18 5 59.9	1.298	21	20 26 34.10	2.1363	15 18 4.5	5.475
22	18 42 33.52	2.2850	18 4 39.0	1.398	22	20 28 42.17	2.1329	15 12 33.8	5.547
23	18 44 50.54	2.2822	-18 3 12.2	+1.497	23	20 30 50.05	2.1296	-15 6 58.8	+5.618
MARCH 11.					MARCH 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 47 7.39	2.2794	-18 1 39.4	+1.596	0	20 32 57.72	2.1263	-15 1 19.6	+5.689
1	18 49 24.07	2.2766	18 0 0.7	1.694	1	20 35 5.20	2.1229	14 55 36.1	5.759
2	18 51 40.58	2.2738	17 58 16.1	1.792	2	20 37 12.47	2.1196	14 49 48.5	5.828
3	18 53 56.92	2.2709	17 56 25.7	1.889	3	20 39 19.55	2.1163	14 43 56.8	5.897
4	18 56 13.09	2.2681	17 54 29.4	1.987	4	20 41 26.43	2.1130	14 38 0.9	5.965
5	18 58 29.09	2.2652	17 52 27.3	2.083	5	20 43 33.11	2.1097	14 32 1.0	6.032
6	19 0 44.91	2.2622	17 50 19.5	2.178	6	20 45 39.59	2.1063	14 25 57.1	6.098
7	19 3 0.55	2.2592	17 48 5.9	2.274	7	20 47 45.87	2.1031	14 19 49.3	6.163
8	19 5 16.01	2.2562	17 45 46.6	2.369	8	20 49 51.96	2.0998	14 13 37.5	6.229
9	19 7 31.30	2.2532	17 43 21.6	2.464	9	20 51 57.85	2.0965	14 7 21.8	6.293
10	19 9 46.40	2.2502	17 40 50.9	2.558	10	20 54 3.54	2.0933	14 1 2.3	6.357
11	19 12 1.32	2.2472	17 38 14.7	2.651	11	20 56 9.04	2.0901	13 54 38.9	6.421
12	19 14 16.06	2.2441	17 35 32.8	2.744	12	20 58 14.35	2.0868	13 48 11.8	6.483
13	19 16 30.61	2.2410	17 32 45.4	2.836	13	21 0 19.46	2.0836	13 41 41.0	6.544
14	19 18 44.98	2.2380	17 29 52.5	2.927	14	21 2 24.38	2.0803	13 35 6.5	6.606
15	19 20 59.17	2.2348	17 26 54.1	3.019	15	21 4 29.10	2.0772	13 28 28.3	6.666
16	19 23 13.16	2.2316	17 23 50.2	3.110	16	21 6 33.64	2.0740	13 21 46.6	6.725
17	19 25 26.96	2.2285	17 20 40.9	3.200	17	21 8 37.98	2.0708	13 15 1.3	6.784
18	19 27 40.58	2.2254	17 17 26.2	3.289	18	21 10 42.13	2.0677	13 8 12.5	6.842
19	19 29 54.01	2.2222	17 14 6.2	3.378	19	21 12 46.10	2.0646	13 1 20.3	6.899
20	19 32 7.24	2.2189	17 10 40.8	3.467	20	21 14 49.88	2.0614	12 54 24.6	6.957
21	19 34 20.28	2.2157	17 7 10.2	3.554	21	21 16 53.47	2.0583	12 47 25.5	7.013
22	19 36 33.13	2.2126	17 3 34.3	3.642	22	21 18 56.87	2.0552	12 40 23.1	7.068
23	19 38 45.79	2.2093	16 59 53.2	3.728	23	21 21 0.09	2.0521	12 33 17.3	7.123
24	19 40 58.25	2.2060	-16 56 6.9	+3.814	24	21 23 3.12	2.0490	-12 26 8.3	+7.177

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 14.					MARCH 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 23 3.12	2.0490	-12 26 8.3	+7.177	0	22 58 17.88	1.9297	-5 52 25.4	+8.968
1	21 25 5.97	2.0460	12 18 56.1	7.230	1	23 0 13.61	1.9279	5 43 26.7	8.989
2	21 27 8.64	2.0429	12 11 40.7	7.283	2	23 2 9.23	1.9262	5 34 26.7	9.009
3	21 29 11.12	2.0399	12 4 22.1	7.336	3	25 4 4.75	1.9244	5 25 25.6	9.028
4	21 31 13.43	2.0370	11 57 0.4	7.387	4	23 6 0.16	1.9227	5 16 23.3	9.047
5	21 33 15.56	2.0340	11 49 35.7	7.437	5	23 7 55.47	1.9211	5 7 19.9	9.066
6	21 35 17.51	2.0310	11 42 8.0	7.487	6	23 9 50.69	1.9195	4 58 15.4	9.084
7	21 37 19.28	2.0281	11 34 37.3	7.536	7	23 11 45.81	1.9178	4 49 9.8	9.101
8	21 39 20.88	2.0252	11 27 3.7	7.584	8	23 13 40.83	1.9163	4 40 3.3	9.117
9	21 41 22.30	2.0223	11 19 27.2	7.632	9	23 15 35.76	1.9148	4 30 55.8	9.133
10	21 43 23.55	2.0194	11 11 47.9	7.679	10	23 17 30.60	1.9133	4 21 47.3	9.149
11	21 45 24.63	2.0166	11 4 5.7	7.727	11	23 19 25.35	1.9118	4 12 37.9	9.163
12	21 47 25.54	2.0138	10 56 20.7	7.772	12	23 21 20.02	1.9104	4 3 27.7	9.177
13	21 49 26.28	2.0109	10 48 33.1	7.817	13	23 23 14.60	1.9090	3 54 16.7	9.190
14	21 51 26.85	2.0082	10 40 42.7	7.862	14	23 25 9.10	1.9077	3 45 4.9	9.203
15	21 53 27.26	2.0054	10 32 49.7	7.905	15	23 27 3.52	1.9063	3 35 52.3	9.215
16	21 55 27.50	2.0027	10 24 54.1	7.947	16	23 28 57.86	1.9050	3 26 39.1	9.226
17	21 57 27.58	2.0000	10 16 56.0	7.990	17	23 30 52.12	1.9038	3 17 25.2	9.237
18	21 59 27.50	1.9973	10 8 55.3	8.032	18	23 32 46.31	1.9026	3 8 10.7	9.248
19	22 1 27.26	1.9947	10 0 52.2	8.073	19	23 34 40.43	1.9013	2 58 55.5	9.258
20	22 3 26.86	1.9920	9 52 46.6	8.113	20	23 36 34.47	1.9001	2 49 39.8	9.266
21	22 5 26.30	1.9894	9 44 38.6	8.153	21	23 38 28.44	1.8991	2 40 23.6	9.274
22	22 7 25.59	1.9868	9 36 28.2	8.192	22	23 40 22.36	1.8981	2 31 6.9	9.282
23	22 9 24.72	1.9843	- 9 28 15.5	+8.230	23	23 42 16.21	1.8970	-2 21 49.8	+9.288
MARCH 15.					MARCH 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 11 23.70	1.9818	- 9 20 0.6	+8.268	0	23 44 10.00	1.8960	-2 12 32.3	+9.295
1	22 13 22.53	1.9793	9 11 43.4	8.304	1	23 46 3.73	1.8950	2 3 14.4	9.301
2	22 15 21.21	1.9768	9 3 24.1	8.340	2	23 47 57.40	1.8940	1 53 56.2	9.306
3	22 17 19.75	1.9743	8 55 2.6	8.376	3	23 49 51.01	1.8930	1 44 37.7	9.311
4	22 19 18.13	1.9718	8 46 39.0	8.411	4	23 51 44.56	1.8922	1 35 18.9	9.315
5	22 21 16.37	1.9695	8 38 13.3	8.445	5	23 53 38.07	1.8914	1 25 59.9	9.318
6	22 23 14.47	1.9672	8 29 45.6	8.478	6	23 55 31.53	1.8906	1 16 40.7	9.322
7	22 25 12.43	1.9649	8 21 15.9	8.511	7	23 57 24.94	1.8898	1 7 21.3	9.323
8	22 27 10.26	1.9626	8 12 44.3	8.543	8	23 59 18.30	1.8890	0 58 1.9	9.325
9	22 29 7.94	1.9603	8 4 10.7	8.575	9	0 1 11.62	1.8883	0 48 42.3	9.327
10	22 31 5.49	1.9580	7 55 35.3	8.606	10	0 3 4.90	1.8877	0 39 22.7	9.326
11	22 33 2.90	1.9558	7 46 58.0	8.636	11	0 4 58.14	1.8870	0 30 3.2	9.326
12	22 35 0.18	1.9536	7 38 19.0	8.665	12	0 6 51.34	1.8864	0 20 43.6	9.326
13	22 36 57.33	1.9514	7 29 38.2	8.694	13	0 8 44.51	1.8858	0 11 24.1	9.324
14	22 38 54.35	1.9493	7 20 55.7	8.722	14	0 10 37.64	1.8853	-0 2 4.7	9.322
15	22 40 51.24	1.9472	7 12 11.6	8.749	15	0 12 30.75	1.8849	+0 7 14.5	9.319
16	22 42 48.01	1.9452	7 3 25.8	8.777	16	0 14 23.83	1.8844	0 16 33.6	9.317
17	22 44 44.66	1.9431	6 54 38.4	8.803	17	0 16 16.88	1.8840	0 25 52.5	9.313
18	22 46 41.18	1.9411	6 45 49.4	8.828	18	0 18 9.91	1.8836	0 35 11.1	9.308
19	22 48 37.59	1.9392	6 36 59.0	8.853	19	0 20 2.91	1.8832	0 44 29.4	9.303
20	22 50 33.88	1.9372	6 28 7.1	8.878	20	0 21 55.89	1.8829	0 53 47.4	9.298
21	22 52 30.05	1.9352	6 19 13.7	8.902	21	0 23 48.86	1.8827	1 3 5.1	9.291
22	22 54 26.10	1.9333	6 10 18.9	8.924	22	0 25 41.81	1.8824	1 12 22.3	9.284
23	22 56 22.05	1.9315	6 1 22.8	8.946	23	0 27 34.75	1.8822	1 21 39.2	9.277
24	22 58 17.88	1.9297	- 5 52 25.4	+8.968	24	0 29 27.67	1.8819	+1 30 55.6	+9.269

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 18.					MARCH 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 29 27.67	1.8819	+1 30 55.6	+9.269	0	2 0 14.40	1.9133	+ 8 35 53.4	+8.223
1	0 31 20.58	1.8818	1 40 11.5	9.261	1	2 2 9.24	1.9148	8 44 5.7	8.187
2	0 33 13.49	1.8817	1 49 26.9	9.252	2	2 4 4.17	1.9163	8 52 15.8	8.151
3	0 35 6.39	1.8817	1 58 41.7	9.242	3	2 5 59.19	1.9178	9 0 23.8	8.114
4	0 36 59.29	1.8816	2 7 55.9	9.232	4	2 7 54.30	1.9193	9 8 29.5	8.077
5	0 38 52.18	1.8816	2 17 9.5	9.222	5	2 9 49.50	1.9208	9 16 33.0	8.040
6	0 40 45.08	1.8817	2 26 22.5	9.210	6	2 11 44.80	1.9225	9 24 34.3	8.002
7	0 42 37.98	1.8817	2 35 34.7	9.197	7	2 13 40.20	1.9241	9 32 33.2	7.963
8	0 44 30.88	1.8818	2 44 46.2	9.185	8	2 15 35.69	1.9257	9 40 29.8	7.923
9	0 46 23.79	1.8819	2 53 56.9	9.172	9	2 17 31.28	1.9274	9 48 24.0	7.883
10	0 48 16.71	1.8821	3 3 6.8	9.158	10	2 19 26.98	1.9292	9 56 15.8	7.843
11	0 50 9.64	1.8823	3 12 15.9	9.144	11	2 21 22.78	1.9308	10 4 5.2	7.802
12	0 52 2.58	1.8825	3 21 24.1	9.129	12	2 23 18.68	1.9326	10 11 52.1	7.761
13	0 53 55.54	1.8827	3 30 31.4	9.113	13	2 25 14.69	1.9344	10 19 36.5	7.719
14	0 55 48.51	1.8831	3 39 37.7	9.097	14	2 27 10.81	1.9362	10 27 18.4	7.677
15	0 57 41.51	1.8835	3 48 43.1	9.082	15	2 29 7.04	1.9381	10 34 57.7	7.633
16	0 59 34.53	1.8838	3 57 47.5	9.065	16	2 31 3.38	1.9399	10 42 34.4	7.590
17	1 1 27.57	1.8842	4 6 50.9	9.047	17	2 32 59.83	1.9417	10 50 8.5	7.546
18	1 3 20.63	1.8846	4 15 53.1	9.028	18	2 34 56.39	1.9437	10 57 39.9	7.501
19	1 5 13.72	1.8851	4 24 54.3	9.010	19	2 36 53.08	1.9457	11 5 8.6	7.456
20	1 7 6.84	1.8857	4 33 54.3	8.990	20	2 38 49.88	1.9477	11 12 34.6	7.410
21	1 9 0.00	1.8862	4 42 53.1	8.970	21	2 40 46.80	1.9497	11 19 57.8	7.364
22	1 10 53.19	1.8867	4 51 50.7	8.949	22	2 42 43.85	1.9518	11 27 18.3	7.317
23	1 12 46.41	1.8873	+5 0 47.0	+8.928	23	2 44 41.02	1.9538	+11 34 35.9	+7.269
MARCH 19.					MARCH 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 14 39.67	1.8880	+5 9 42.1	+8.907	0	2 46 38.31	1.9559	+11 41 50.6	+7.222
1	1 16 32.97	1.8887	5 18 35.9	8.885	1	2 48 35.73	1.9580	11 49 2.5	7.173
2	1 18 26.31	1.8894	5 27 28.3	8.862	2	2 50 33.27	1.9602	11 56 11.4	7.124
3	1 20 19.70	1.8902	5 36 19.3	8.838	3	2 52 30.95	1.9623	12 3 17.4	7.075
4	1 22 13.13	1.8909	5 45 8.9	8.815	4	2 54 28.75	1.9645	12 10 20.4	7.024
5	1 24 6.61	1.8917	5 53 57.1	8.791	5	2 56 26.69	1.9667	12 17 20.3	6.974
6	1 26 0.14	1.8926	6 2 43.8	8.766	6	2 58 24.76	1.9690	12 24 17.3	6.923
7	1 27 53.72	1.8935	6 11 29.0	8.741	7	3 0 22.97	1.9712	12 31 11.1	6.871
8	1 29 47.36	1.8944	6 20 12.7	8.715	8	3 2 21.31	1.9734	12 38 1.8	6.818
9	1 31 41.05	1.8953	6 28 54.8	8.687	9	3 4 19.78	1.9757	12 44 49.3	6.766
10	1 33 34.80	1.8963	6 37 35.2	8.660	10	3 6 18.40	1.9781	12 51 33.7	6.713
11	1 35 28.61	1.8973	6 46 14.0	8.632	11	3 8 17.15	1.9804	12 58 14.9	6.659
12	1 37 22.48	1.8983	6 54 51.1	8.604	12	3 10 16.05	1.9828	13 4 52.8	6.604
13	1 39 16.41	1.8994	7 3 26.5	8.575	13	3 12 15.09	1.9852	13 11 27.4	6.550
14	1 41 10.41	1.9006	7 12 0.1	8.546	14	3 14 14.27	1.9876	13 17 58.8	6.494
15	1 43 4.48	1.9017	7 20 32.0	8.517	15	3 16 13.60	1.9900	13 24 26.7	6.438
16	1 44 58.61	1.9028	7 29 2.1	8.486	16	3 18 13.07	1.9924	13 30 51.3	6.382
17	1 46 52.82	1.9041	7 37 30.3	8.454	17	3 20 12.69	1.9949	13 37 12.5	6.325
18	1 48 47.10	1.9053	7 45 56.6	8.422	18	3 22 12.46	1.9974	13 43 30.3	6.267
19	1 50 41.45	1.9065	7 54 21.0	8.391	19	3 24 12.38	1.9999	13 49 44.6	6.209
20	1 52 35.88	1.9078	8 2 43.5	8.358	20	3 26 12.45	2.0024	13 55 55.4	6.150
21	1 54 30.39	1.9092	8 11 4.0	8.325	21	3 28 12.67	2.0050	14 2 2.6	6.091
22	1 56 24.98	1.9105	8 19 22.5	8.292	22	3 30 13.05	2.0076	14 8 6.3	6.032
23	1 58 19.65	1.9118	8 27 39.0	8.258	23	3 32 13.58	2.0101	14 14 6.4	5.971
24	2 0 14.40	1.9133	+8 35 53.4	+8.223	24	3 34 14.26	2.0127	+14 20 2.8	+5.910

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 22.					MARCH 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 34 14.26	2.0127	+14 20 2.8	+5.910	0	5 14 3.36	2.1486	+17 43 40.2	+2.378
1	3 36 15.10	2.0152	14 25 55.6	5.848	1	5 16 12.36	2.1515	17 46 0.3	2.293
2	3 38 16.09	2.0179	14 31 44.6	5.787	2	5 18 21.54	2.1544	17 48 15.3	2.207
3	3 40 17.25	2.0206	14 37 30.0	5.724	3	5 20 30.89	2.1573	17 50 25.1	2.120
4	3 42 18.56	2.0232	14 43 11.5	5.661	4	5 22 40.42	2.1602	17 52 29.7	2.033
5	3 44 20.04	2.0259	14 48 49.3	5.598	5	5 24 50.11	2.1629	17 54 29.1	1.945
6	3 46 21.67	2.0286	14 54 23.3	5.534	6	5 26 59.97	2.1658	17 56 23.1	1.857
7	3 48 23.47	2.0313	14 59 53.4	5.469	7	5 29 10.01	2.1687	17 58 11.9	1.769
8	3 50 25.43	2.0340	15 5 19.6	5.404	8	5 31 20.21	2.1714	17 59 55.4	1.680
9	3 52 27.55	2.0367	15 10 41.9	5.338	9	5 33 30.58	2.1742	18 1 33.5	1.591
10	3 54 29.84	2.0395	15 16 0.2	5.272	10	5 35 41.12	2.1771	18 3 6.3	1.502
11	3 56 32.29	2.0423	15 21 14.6	5.206	11	5 37 51.83	2.1798	18 4 33.7	1.411
12	3 58 34.91	2.0450	15 26 24.9	5.138	12	5 40 2.70	2.1826	18 5 55.6	1.320
13	4 0 37.69	2.0478	15 31 31.2	5.071	13	5 42 13.74	2.1853	18 7 12.1	1.229
14	4 2 40.65	2.0507	15 36 33.4	5.002	14	5 44 24.94	2.1881	18 8 23.1	1.138
15	4 4 43.77	2.0533	15 41 31.5	4.933	15	5 46 36.31	2.1909	18 9 28.7	1.047
16	4 6 47.05	2.0562	15 46 25.4	4.864	16	5 48 47.85	2.1936	18 10 28.7	0.954
17	4 8 50.51	2.0590	15 51 15.2	4.795	17	5 50 59.54	2.1963	18 11 23.2	0.862
18	4 10 54.13	2.0618	15 56 0.8	4.724	18	5 53 11.40	2.1990	18 12 12.1	0.768
19	4 12 57.93	2.0647	16 0 42.1	4.653	19	5 55 23.42	2.2017	18 12 55.4	0.676
20	4 15 1.89	2.0675	16 5 19.2	4.582	20	5 57 35.60	2.2043	18 13 33.2	0.583
21	4 17 6.03	2.0704	16 9 52.0	4.510	21	5 59 47.94	2.2069	18 14 5.3	0.488
22	4 19 10.34	2.0732	16 14 20.4	4.438	22	6 2 0.43	2.2096	18 14 31.7	0.393
23	4 21 14.82	2.0761	+16 18 44.5	+4.365	23	6 4 13.09	2.2123	+18 14 52.5	+0.299
MARCH 23.					MARCH 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 23 19.47	2.0790	+16 23 4.2	+4.292	0	6 6 25.90	2.2148	+18 15 7.6	+0.204
1	4 25 24.30	2.0819	16 27 19.5	4.217	1	6 8 38.86	2.2174	18 15 17.0	0.108
2	4 27 29.30	2.0848	16 31 30.3	4.142	2	6 10 51.99	2.2200	18 15 20.6	+0.013
3	4 29 34.47	2.0876	16 35 36.6	4.067	3	6 13 5.26	2.2225	18 15 18.5	-0.083
4	4 31 39.81	2.0905	16 39 38.4	3.992	4	6 15 18.69	2.2251	18 15 10.6	0.180
5	4 33 45.33	2.0934	16 43 35.6	3.916	5	6 17 32.27	2.2275	18 14 56.9	0.277
6	4 35 51.02	2.0963	16 47 28.3	3.840	6	6 19 45.99	2.2300	18 14 37.4	0.373
7	4 37 56.89	2.0992	16 51 16.4	3.763	7	6 21 59.87	2.2325	18 14 12.1	0.471
8	4 40 2.93	2.1022	16 54 59.8	3.685	8	6 24 13.89	2.2350	18 13 40.9	0.568
9	4 42 9.15	2.1051	16 58 38.6	3.607	9	6 26 28.07	2.2374	18 13 3.9	0.666
10	4 44 15.54	2.1080	17 2 12.7	3.528	10	6 28 42.38	2.2397	18 12 21.0	0.765
11	4 46 22.11	2.1109	17 5 42.0	3.449	11	6 30 56.84	2.2422	18 11 32.1	0.863
12	4 48 28.85	2.1138	17 9 6.6	3.370	12	6 33 11.44	2.2445	18 10 37.4	0.962
13	4 50 35.76	2.1167	17 12 26.4	3.290	13	6 35 26.18	2.2469	18 9 36.7	1.061
14	4 52 42.85	2.1197	17 15 41.4	3.209	14	6 37 41.07	2.2492	18 8 30.1	1.160
15	4 54 50.12	2.1226	17 18 51.5	3.128	15	6 39 56.09	2.2515	18 7 17.5	1.260
16	4 56 57.56	2.1255	17 21 56.8	3.047	16	6 42 11.25	2.2537	18 5 58.9	1.360
17	4 59 5.18	2.1284	17 24 57.2	2.966	17	6 44 26.54	2.2560	18 4 34.3	1.460
18	5 1 12.97	2.1312	17 27 52.7	2.883	18	6 46 41.97	2.2583	18 3 3.7	1.561
19	5 3 20.93	2.1342	17 30 43.1	2.799	19	6 48 57.54	2.2606	18 1 27.0	1.661
20	5 5 29.07	2.1371	17 33 28.6	2.717	20	6 51 13.24	2.2627	17 59 44.4	1.761
21	5 7 37.38	2.1400	17 36 9.1	2.633	21	6 53 29.06	2.2648	17 57 55.7	1.862
22	5 9 45.87	2.1429	17 38 44.6	2.548	22	6 55 45.02	2.2671	17 56 0.9	1.963
23	5 11 54.53	2.1458	17 41 14.9	2.463	23	6 58 1.11	2.2691	17 54 0.1	2.064
24	5 14 3.36	2.1486	+17 43 40.2	+2.378	24	7 0 17.31	2.2711	+17 51 53.2	-2.166

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 26.					MARCH 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 0 17.31	2.2711	+17 51 53.2	-2.166	0	8 51 14.83	2.3430	+14 10 33.3	-7.011
1	7 2 33.64	2.2732	17 49 40.2	2.268	1	8 53 35.44	2.3440	14 3 29.8	7.106
2	7 4 50.10	2.2753	17 47 21.1	2.369	2	8 55 56.11	2.3449	13 56 20.6	7.201
3	7 7 6.68	2.2773	17 44 55.9	2.471	3	8 58 16.83	2.3458	13 49 5.7	7.295
4	7 9 23.37	2.2793	17 42 24.6	2.573	4	9 0 37.61	2.3467	13 41 45.2	7.389
5	7 11 40.19	2.2813	17 39 47.2	2.675	5	9 2 58.44	2.3477	13 34 19.0	7.482
6	7 13 57.12	2.2832	17 37 3.6	2.777	6	9 5 19.33	2.3485	13 26 47.3	7.574
7	7 16 14.17	2.2852	17 34 13.9	2.879	7	9 7 40.26	2.3493	13 19 10.1	7.667
8	7 18 31.34	2.2871	17 31 18.1	2.982	8	9 10 1.25	2.3503	13 11 27.3	7.759
9	7 20 48.62	2.2890	17 28 16.1	3.084	9	9 12 22.30	2.3512	13 3 39.0	7.850
10	7 23 6.02	2.2908	17 25 8.0	3.187	10	9 14 43.39	2.3519	12 55 45.3	7.941
11	7 25 23.52	2.2926	17 21 53.7	3.289	11	9 17 4.53	2.3527	12 47 46.1	8.031
12	7 27 41.13	2.2944	17 18 33.3	3.391	12	9 19 25.72	2.3536	12 39 41.6	8.120
13	7 29 58.85	2.2962	17 15 6.8	3.493	13	9 21 46.96	2.3543	12 31 31.7	8.208
14	7 32 16.67	2.2978	17 11 34.1	3.597	14	9 24 8.24	2.3551	12 23 16.6	8.296
15	7 34 34.59	2.2996	17 7 55.2	3.700	15	9 26 29.57	2.3559	12 14 56.2	8.384
16	7 36 52.62	2.3013	17 4 10.1	3.803	16	9 28 50.95	2.3567	12 6 30.5	8.471
17	7 39 10.74	2.3029	17 0 18.9	3.905	17	9 31 12.37	2.3574	11 57 59.7	8.557
18	7 41 28.97	2.3047	16 56 21.5	4.007	18	9 33 33.84	2.3582	11 49 23.7	8.642
19	7 43 47.30	2.3063	16 52 18.0	4.110	19	9 35 55.35	2.3588	11 40 42.6	8.727
20	7 46 5.72	2.3078	16 48 8.3	4.213	20	9 38 16.90	2.3596	11 31 56.5	8.810
21	7 48 24.23	2.3094	16 43 52.4	4.315	21	9 40 38.50	2.3603	11 23 5.4	8.893
22	7 50 42.85	2.3110	16 39 30.5	4.417	22	9 43 0.14	2.3610	11 14 9.3	8.975
23	7 53 1.55	2.3124	+16 35 2.4	-4.520	23	9 45 21.82	2.3617	+11 5 8.4	-9.056
MARCH 27.					MARCH 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 55 20.34	2.3139	+16 30 28.1	-4.622	0	9 47 43.54	2.3623	+10 56 2.6	-9.137
1	7 57 39.22	2.3154	16 25 47.7	4.724	1	9 50 5.30	2.3631	10 46 51.9	9.218
2	7 59 58.19	2.3168	16 21 1.2	4.826	2	9 52 27.11	2.3638	10 37 36.4	9.297
3	8 2 17.24	2.3183	16 16 8.6	4.928	3	9 54 48.95	2.3644	10 28 16.3	9.374
4	8 4 36.38	2.3197	16 11 9.8	5.030	4	9 57 10.84	2.3652	10 18 51.5	9.451
5	8 6 55.60	2.3210	16 6 5.0	5.131	5	9 59 32.77	2.3658	10 9 22.2	9.527
6	8 9 14.90	2.3223	16 0 54.1	5.232	6	10 1 54.73	2.3664	9 59 48.2	9.603
7	8 11 34.28	2.3237	15 55 37.1	5.334	7	10 4 16.74	2.3672	9 50 9.8	9.677
8	8 13 53.75	2.3251	15 50 14.0	5.435	8	10 6 38.79	2.3678	9 40 27.0	9.750
9	8 16 13.29	2.3263	15 44 44.9	5.535	9	10 9 0.88	2.3684	9 30 39.8	9.823
10	8 18 32.90	2.3275	15 39 9.8	5.636	10	10 11 23.00	2.3691	9 20 48.2	9.895
11	8 20 52.59	2.3288	15 33 28.6	5.737	11	10 13 45.17	2.3698	9 10 52.4	9.965
12	8 23 12.36	2.3301	15 27 41.4	5.836	12	10 16 7.37	2.3703	9 0 52.4	10.035
13	8 25 32.20	2.3313	15 21 48.3	5.936	13	10 18 29.61	2.3711	8 50 48.2	10.103
14	8 27 52.11	2.3324	15 15 49.1	6.036	14	10 20 51.90	2.3718	8 40 40.0	10.171
15	8 30 12.09	2.3335	15 9 44.0	6.135	15	10 23 14.22	2.3723	8 30 27.7	10.238
16	8 32 32.13	2.3347	15 3 32.9	6.233	16	10 25 36.58	2.3730	8 20 11.4	10.303
17	8 34 52.25	2.3358	14 57 16.0	6.332	17	10 27 58.98	2.3737	8 9 51.3	10.367
18	8 37 12.43	2.3368	14 50 53.1	6.431	18	10 30 21.42	2.3743	7 59 27.3	10.431
19	8 39 32.67	2.3379	14 44 24.3	6.528	19	10 32 43.90	2.3750	7 48 59.6	10.493
20	8 41 52.98	2.3390	14 37 49.7	6.625	20	10 35 6.42	2.3757	7 38 28.2	10.554
21	8 44 13.35	2.3401	14 31 9.3	6.722	21	10 37 28.98	2.3763	7 27 53.1	10.614
22	8 46 33.79	2.3411	14 24 23.1	6.818	22	10 39 51.58	2.3770	7 17 14.5	10.673
23	8 48 54.28	2.3420	14 17 31.1	6.915	23	10 42 14.22	2.3777	7 6 32.4	10.730
24	8 51 14.83	2.3430	+14 10 33.3	-7.011	24	10 44 36.90	2.3783	+ 6 55 46.9	-10.787

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MARCH 30.					APRIL 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 44 36.90	2.3783	+6 55 46.9	-10.787	0	12 39 42.96	2.4213	- 2 21 37.5	-11.880
1	10 46 59.62	2.3791	6 44 58.0	10.842	1	12 42 8.27	2.4224	2 33 29.9	11.865
2	10 49 22.39	2.3797	6 34 5.9	10.896	2	12 44 33.65	2.4236	2 45 21.3	11.849
3	10 51 45.19	2.3803	6 23 10.5	10.949	3	12 46 59.10	2.4247	2 57 11.8	11.832
4	10 54 8.03	2.3811	6 12 12.0	11.000	4	12 49 24.62	2.4258	3 9 1.2	11.813
5	10 56 30.92	2.3818	6 1 10.5	11.051	5	12 51 50.20	2.4270	3 20 49.4	11.792
6	10 58 53.85	2.3826	5 50 5.9	11.100	6	12 54 15.86	2.4282	3 32 36.3	11.770
7	11 1 16.83	2.3833	5 38 58.5	11.147	7	12 56 41.58	2.4293	3 44 21.8	11.747
8	11 3 39.85	2.3840	5 27 48.3	11.193	8	12 59 7.38	2.4306	3 56 5.9	11.722
9	11 6 2.91	2.3847	5 16 35.3	11.239	9	13 1 33.25	2.4317	4 7 48.4	11.694
10	11 8 26.02	2.3855	5 5 19.6	11.283	10	13 3 59.18	2.4328	4 19 29.2	11.666
11	11 10 49.17	2.3862	4 54 1.3	11.326	11	13 6 25.19	2.4341	4 31 8.3	11.636
12	11 13 12.37	2.3871	4 42 40.5	11.367	12	13 8 51.27	2.4353	4 42 45.5	11.604
13	11 15 35.62	2.3878	4 31 17.3	11.407	13	13 11 17.42	2.4364	4 54 20.8	11.571
14	11 17 58.91	2.3886	4 19 51.7	11.445	14	13 13 43.64	2.4376	5 5 54.0	11.536
15	11 20 22.25	2.3893	4 8 23.9	11.482	15	13 16 9.93	2.4388	5 17 25.1	11.500
16	11 22 45.63	2.3902	3 56 53.9	11.518	16	13 18 36.30	2.4401	5 28 54.0	11.462
17	11 25 9.07	2.3911	3 45 21.7	11.552	17	13 21 2.74	2.4412	5 40 20.6	11.423
18	11 27 32.56	2.3918	3 33 47.6	11.585	18	13 23 29.24	2.4423	5 51 44.8	11.382
19	11 29 56.09	2.3927	3 22 11.5	11.617	19	13 25 55.82	2.4436	6 3 6.5	11.340
20	11 32 19.68	2.3935	3 10 33.6	11.646	20	13 28 22.47	2.4448	6 14 25.6	11.296
21	11 34 43.31	2.3943	2 58 54.0	11.675	21	13 30 49.20	2.4460	6 25 42.0	11.250
22	11 37 7.00	2.3952	2 47 12.6	11.703	22	13 33 15.99	2.4471	6 36 55.6	11.202
23	11 39 30.74	2.3961	+2 35 29.7	-11.728	23	13 35 42.85	2.4483	- 6 48 6.3	-11.154
MARCH 31.					APRIL 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 41 54.53	2.3969	+2 23 45.2	-11.753	0	13 38 9.79	2.4496	- 6 59 14.1	-11.105
1	11 44 18.37	2.3978	2 11 59.3	11.776	1	13 40 36.80	2.4507	7 10 18.9	11.053
2	11 46 42.27	2.3988	2 0 12.1	11.797	2	13 43 3.87	2.4518	7 21 20.5	11.000
3	11 49 6.23	2.3997	1 48 23.7	11.817	3	13 45 31.02	2.4530	7 32 18.9	10.945
4	11 51 30.24	2.4006	1 36 34.1	11.836	4	13 47 58.23	2.4542	7 43 13.9	10.889
5	11 53 54.30	2.4015	1 24 43.4	11.852	5	13 50 25.52	2.4553	7 54 5.6	10.832
6	11 56 18.42	2.4025	1 12 51.8	11.867	6	13 52 52.87	2.4564	8 4 53.8	10.774
7	11 58 42.60	2.4034	1 0 59.3	11.882	7	13 55 20.29	2.4575	8 15 38.5	10.714
8	12 1 6.83	2.4044	0 49 6.0	11.893	8	13 57 47.77	2.4586	8 26 19.5	10.652
9	12 3 31.13	2.4054	0 37 12.1	11.904	9	14 0 15.32	2.4597	8 36 56.7	10.589
10	12 5 55.48	2.4063	0 25 17.5	11.914	10	14 2 42.94	2.4608	8 47 30.2	10.525
11	12 8 19.89	2.4073	0 13 22.4	11.922	11	14 5 10.62	2.4619	8 57 59.7	10.459
12	12 10 44.36	2.4083	+0 1 26.9	11.928	12	14 7 38.37	2.4630	9 8 25.3	10.392
13	12 13 8.89	2.4094	-0 10 28.9	11.932	13	14 10 6.18	2.4640	9 18 46.8	10.323
14	12 15 33.49	2.4105	0 22 25.0	11.936	14	14 12 34.05	2.4651	9 29 4.1	10.254
15	12 17 58.15	2.4115	0 34 21.2	11.937	15	14 15 1.99	2.4661	9 39 17.3	10.183
16	12 20 22.87	2.4125	0 46 17.4	11.937	16	14 17 29.98	2.4670	9 49 22.1	10.110
17	12 22 47.65	2.4136	0 58 13.6	11.935	17	14 19 58.03	2.4681	9 59 30.5	10.037
18	12 25 12.50	2.4147	1 10 9.6	11.932	18	14 22 26.15	2.4690	10 9 30.5	9.962
19	12 27 37.41	2.4157	1 22 5.4	11.928	19	14 24 54.31	2.4699	10 19 25.9	9.885
20	12 30 2.39	2.4168	1 34 0.9	11.921	20	14 27 22.54	2.4709	10 29 16.7	9.808
21	12 32 27.43	2.4179	1 45 55.9	11.912	21	14 29 50.82	2.4718	10 39 2.9	9.730
22	12 34 52.54	2.4191	1 57 50.4	11.903	22	14 32 19.15	2.4726	10 48 44.3	9.649
23	12 37 17.72	2.4202	2 9 44.3	11.892	23	14 34 47.53	2.4735	10 58 20.8	9.568
24	12 39 42.96	2.4213	-2 21 37.5	-11.880	24	14 37 15.97	2.4743	-11 7 52.5	-9.487

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 3.					APRIL 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 37 15.97	2.4743	-11 7 52.5	-9.487	0	16 36 19.73	2.4699	-16 50 18.9	-4.513
1	14 39 44.45	2.4751	11 17 19.2	9.402	1	16 38 47.89	2.4687	16 54 46.2	4.396
2	14 42 12.98	2.4759	11 26 40.8	9.317	2	16 41 15.97	2.4673	16 59 6.4	4.279
3	14 44 41.56	2.4767	11 35 57.3	9.232	3	16 43 43.96	2.4659	17 3 19.7	4.162
4	14 47 10.18	2.4773	11 45 8.7	9.146	4	16 46 11.88	2.4645	17 7 25.9	4.045
5	14 49 38.84	2.4781	11 54 14.8	9.057	5	16 48 39.70	2.4629	17 11 25.1	3.928
6	14 52 7.55	2.4787	12 3 15.5	8.967	6	16 51 7.43	2.4614	17 15 17.3	3.812
7	14 54 36.29	2.4793	12 12 10.9	8.878	7	16 53 35.07	2.4598	17 19 2.5	3.694
8	14 57 5.07	2.4799	12 21 0.9	8.787	8	16 56 2.61	2.4582	17 22 40.6	3.577
9	14 59 33.88	2.4805	12 29 45.4	8.695	9	16 58 30.06	2.4565	17 26 11.7	3.459
10	15 2 2.73	2.4811	12 38 24.3	8.602	10	17 0 57.39	2.4547	17 29 35.7	3.342
11	15 4 31.61	2.4816	12 46 57.6	8.508	11	17 3 24.62	2.4529	17 32 52.7	3.224
12	15 7 0.52	2.4821	12 55 25.2	8.413	12	17 5 51.74	2.4510	17 36 2.6	3.107
13	15 9 29.46	2.4825	13 3 47.1	8.316	13	17 8 18.74	2.4491	17 39 5.5	2.990
14	15 11 58.42	2.4829	13 12 3.1	8.218	14	17 10 45.63	2.4471	17 42 1.4	2.872
15	15 14 27.41	2.4832	13 20 13.3	8.121	15	17 13 12.39	2.4451	17 44 50.2	2.754
16	15 16 56.41	2.4835	13 28 17.6	8.022	16	17 15 39.04	2.4430	17 47 31.9	2.637
17	15 19 25.43	2.4838	13 36 15.9	7.922	17	17 18 5.55	2.4408	17 50 6.7	2.521
18	15 21 54.47	2.4841	13 44 8.3	7.822	18	17 20 31.93	2.4387	17 52 34.4	2.403
19	15 24 23.52	2.4843	13 51 54.5	7.720	19	17 22 58.19	2.4364	17 54 55.1	2.287
20	15 26 52.59	2.4845	13 59 34.7	7.618	20	17 25 24.30	2.4340	17 57 8.8	2.170
21	15 29 21.66	2.4845	14 7 8.7	7.515	21	17 27 50.27	2.4317	17 59 15.5	2.054
22	15 31 50.73	2.4847	14 14 36.5	7.412	22	17 30 16.11	2.4293	18 1 15.3	1.938
23	15 34 19.82	2.4848	-14 21 58.1	-7.307	23	17 32 41.79	2.4268	-18 3 8.0	-1.821
APRIL 4.					APRIL 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 36 48.90	2.4847	-14 29 13.3	-7.201	0	17 35 7.33	2.4244	-18 4 53.8	-1.706
1	15 39 17.98	2.4847	14 36 22.2	7.096	1	17 37 32.72	2.4218	18 6 32.7	1.590
2	15 41 47.06	2.4846	14 43 24.8	6.989	2	17 39 57.95	2.4192	18 8 4.6	1.473
3	15 44 16.13	2.4844	14 50 20.9	6.882	3	17 42 23.02	2.4165	18 9 29.5	1.358
4	15 46 45.19	2.4842	14 57 10.6	6.773	4	17 44 47.93	2.4138	18 10 47.6	1.244
5	15 49 14.23	2.4839	15 3 53.7	6.665	5	17 47 12.68	2.4111	18 11 58.8	1.130
6	15 51 43.26	2.4837	15 10 30.4	6.557	6	17 49 37.26	2.4083	18 13 3.2	1.016
7	15 54 12.27	2.4833	15 17 0.5	6.446	7	17 52 1.67	2.4054	18 14 0.7	0.901
8	15 56 41.26	2.4830	15 23 23.9	6.336	8	17 54 25.91	2.4026	18 14 51.3	0.788
9	15 59 10.23	2.4826	15 29 40.8	6.226	9	17 56 49.98	2.3996	18 15 35.2	0.675
10	16 1 39.17	2.4820	15 35 51.0	6.114	10	17 59 13.86	2.3966	18 16 12.3	0.562
11	16 4 8.07	2.4815	15 41 54.5	6.002	11	18 1 37.57	2.3936	18 16 42.7	0.450
12	16 6 36.95	2.4810	15 47 51.2	5.889	12	18 4 1.09	2.3905	18 17 6.3	0.337
13	16 9 5.79	2.4803	15 53 41.2	5.777	13	18 6 24.43	2.3874	18 17 23.2	0.226
14	16 11 34.59	2.4797	15 59 24.4	5.663	14	18 8 47.58	2.3842	18 17 33.4	0.115
15	16 14 3.35	2.4790	16 5 0.8	5.550	15	18 11 10.54	2.3810	18 17 37.0	-0.004
16	16 16 32.07	2.4782	16 10 30.4	5.437	16	18 13 33.30	2.3778	18 17 33.9	+0.107
17	16 19 0.73	2.4773	16 15 53.2	5.322	17	18 15 55.87	2.3746	18 17 24.2	0.216
18	16 21 29.34	2.4764	16 21 9.0	5.207	18	18 18 18.25	2.3713	18 17 8.0	0.325
19	16 23 57.90	2.4754	16 26 18.0	5.093	19	18 20 40.42	2.3678	18 16 45.2	0.435
20	16 26 26.39	2.4744	16 31 20.1	4.978	20	18 23 2.39	2.3644	18 16 15.8	0.543
21	16 28 54.83	2.4734	16 36 15.3	4.862	21	18 25 24.15	2.3610	18 15 40.0	0.650
22	16 31 23.20	2.4723	16 41 3.5	4.745	22	18 27 45.71	2.3576	18 14 57.8	0.757
23	16 33 51.50	2.4711	16 45 44.7	4.628	23	18 30 7.06	2.3541	18 14 9.1	0.865
24	16 36 19.73	2.4699	-16 50 18.9	-4.513	24	18 32 28.20	2.3506	-18 13 14.0	+0.972

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 7.					APRIL 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 32 28.20	2.3506	-18 13 14.0	+0.972	0	20 20 48.34	2.1593	-15 35 55.5	+5.321
1	18 34 49.13	2.3470	18 12 12.5	1.077	1	20 22 57.78	2.1553	15 30 34.0	5.394
2	18 37 9.84	2.3433	18 11 4.8	1.182	2	20 25 6.98	2.1513	15 25 8.2	5.467
3	18 39 30.33	2.3397	18 9 50.7	1.287	3	20 27 15.93	2.1473	15 19 38.0	5.539
4	18 41 50.60	2.3361	18 8 30.3	1.392	4	20 29 24.65	2.1433	15 14 3.5	5.610
5	18 44 10.66	2.3324	18 7 3.7	1.494	5	20 31 33.12	2.1392	15 8 24.8	5.680
6	18 46 30.49	2.3287	18 5 31.0	1.597	6	20 33 41.35	2.1352	15 2 41.9	5.750
7	18 48 50.10	2.3249	18 3 52.1	1.700	7	20 35 49.34	2.1312	14 56 54.8	5.819
8	18 51 9.48	2.3212	18 2 7.0	1.802	8	20 37 57.10	2.1273	14 51 3.6	5.887
9	18 53 28.64	2.3174	18 0 15.8	1.903	9	20 40 4.62	2.1233	14 45 8.3	5.955
10	18 55 47.57	2.3136	17 58 18.6	2.003	10	20 42 11.90	2.1194	14 39 9.0	6.022
11	18 58 6.27	2.3097	17 56 15.4	2.103	11	20 44 18.95	2.1155	14 33 5.7	6.088
12	19 0 24.73	2.3058	17 54 6.2	2.202	12	20 46 25.76	2.1116	14 26 58.5	6.153
13	19 2 42.97	2.3020	17 51 51.1	2.301	13	20 48 32.34	2.1077	14 20 47.4	6.217
14	19 5 0.97	2.2980	17 49 30.1	2.399	14	20 50 38.69	2.1038	14 14 32.4	6.281
15	19 7 18.73	2.2940	17 47 3.2	2.497	15	20 52 44.80	2.1000	14 8 13.7	6.344
16	19 9 36.25	2.2902	17 44 30.4	2.594	16	20 54 50.69	2.0962	14 1 51.1	6.407
17	19 11 53.55	2.2863	17 41 51.9	2.689	17	20 56 56.35	2.0924	13 55 24.9	6.468
18	19 14 10.60	2.2822	17 39 7.7	2.785	18	20 59 1.78	2.0887	13 48 54.9	6.530
19	19 16 27.41	2.2782	17 36 17.7	2.880	19	21 1 6.99	2.0849	13 42 21.3	6.590
20	19 18 43.98	2.2742	17 33 22.1	2.973	20	21 3 11.97	2.0812	13 35 44.1	6.649
21	19 21 0.31	2.2702	17 30 20.9	3.067	21	21 5 16.73	2.0775	13 29 3.4	6.708
22	19 23 16.40	2.2662	17 27 14.1	3.160	22	21 7 21.27	2.0738	13 22 19.1	6.767
23	19 25 32.25	2.2621	-17 24 1.7	+3.252	23	21 9 25.58	2.0701	-13 15 31.4	+6.823
APRIL 8.					APRIL 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 27 47.85	2.2580	-17 20 43.8	+3.343	0	21 11 29.68	2.0665	-13 8 40.3	+6.880
1	19 30 3.21	2.2539	17 17 20.5	3.434	1	21 13 33.56	2.0628	13 1 45.8	6.937
2	19 32 18.32	2.2498	17 13 51.7	3.524	2	21 15 37.22	2.0592	12 54 47.9	6.993
3	19 34 33.19	2.2457	17 10 17.6	3.613	3	21 17 40.67	2.0557	12 47 46.7	7.047
4	19 36 47.81	2.2417	17 6 38.1	3.702	4	21 19 43.91	2.0522	12 40 42.3	7.100
5	19 39 2.19	2.2375	17 2 53.4	3.789	5	21 21 46.94	2.0487	12 33 34.7	7.153
6	19 41 16.31	2.2333	16 59 3.4	3.877	6	21 23 49.75	2.0452	12 26 23.9	7.206
7	19 43 30.19	2.2293	16 55 8.2	3.963	7	21 25 52.36	2.0417	12 19 10.0	7.258
8	19 45 43.83	2.2252	16 51 7.8	4.049	8	21 27 54.76	2.0383	12 11 53.0	7.309
9	19 47 57.22	2.2211	16 47 2.3	4.133	9	21 29 56.96	2.0350	12 4 32.9	7.360
10	19 50 10.36	2.2169	16 42 51.8	4.218	10	21 31 58.96	2.0316	11 57 9.8	7.409
11	19 52 23.25	2.2128	16 38 36.2	4.302	11	21 34 0.75	2.0283	11 49 43.8	7.458
12	19 54 35.89	2.2087	16 34 15.6	4.384	12	21 36 2.35	2.0250	11 42 14.8	7.507
13	19 56 48.29	2.2045	16 29 50.1	4.466	13	21 38 3.75	2.0217	11 34 42.9	7.554
14	19 59 0.43	2.2003	16 25 19.7	4.547	14	21 40 4.96	2.0185	11 27 8.3	7.601
15	20 1 12.33	2.1963	16 20 44.4	4.628	15	21 42 5.97	2.0153	11 19 30.8	7.648
16	20 3 23.99	2.1922	16 16 4.3	4.708	16	21 44 6.79	2.0121	11 11 50.5	7.694
17	20 5 35.39	2.1880	16 11 19.5	4.787	17	21 46 7.42	2.0089	11 4 7.5	7.738
18	20 7 46.55	2.1840	16 6 29.9	4.866	18	21 48 7.86	2.0058	10 56 21.9	7.783
19	20 9 57.47	2.1798	16 1 35.6	4.943	19	21 50 8.12	2.0027	10 48 33.5	7.827
20	20 12 8.13	2.1757	15 56 36.7	5.020	20	21 52 8.19	1.9997	10 40 42.6	7.866
21	20 14 18.55	2.1717	15 51 33.2	5.097	21	21 54 8.08	1.9967	10 32 49.2	7.912
22	20 16 28.73	2.1676	15 46 25.1	5.173	22	21 56 7.79	1.9937	10 24 53.2	7.954
23	20 18 38.66	2.1634	15 41 12.5	5.247	23	21 58 7.32	1.9907	10 16 54.7	7.995
24	20 20 48.34	2.1593	-15 35 55.5	+5.321	24	22 0 6.68	1.9878	-10 8 53.8	+8.035

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 11.					APRIL 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 0 6.68	1.9878	-10 8 53.8	+8.035	0	23 32 51.64	1.8913	-3 8 47.8	+9.233
1	22 2 5.86	1.9850	10 0 50.5	8.075	1	23 34 45.08	1.8901	2 59 33.5	9.242
2	22 4 4.88	1.9822	9 52 44.8	8.114	2	23 36 38.45	1.8891	2 50 18.7	9.252
3	22 6 3.72	1.9793	9 44 36.8	8.152	3	23 38 31.77	1.8881	2 41 3.3	9.262
4	22 8 2.39	1.9765	9 36 26.5	8.190	4	23 40 25.02	1.8871	2 31 47.3	9.270
5	22 10 0.90	1.9738	9 28 14.0	8.227	5	23 42 18.22	1.8862	2 22 30.9	9.277
6	22 11 59.25	1.9711	9 19 59.3	8.263	6	23 44 11.37	1.8853	2 13 14.1	9.284
7	22 13 57.43	1.9684	9 11 42.4	8.299	7	23 46 4.46	1.8844	2 3 56.8	9.292
8	22 15 55.46	1.9658	9 3 23.4	8.334	8	23 47 57.50	1.8837	1 54 39.1	9.298
9	22 17 53.33	1.9633	8 55 2.3	8.369	9	23 49 50.50	1.8829	1 45 21.1	9.303
10	22 19 51.05	1.9607	8 46 39.1	8.403	10	23 51 43.45	1.8821	1 36 2.8	9.308
11	22 21 48.61	1.9581	8 38 14.0	8.436	11	23 53 36.35	1.8814	1 26 44.1	9.312
12	22 23 46.02	1.9556	8 29 46.8	8.469	12	23 55 29.22	1.8808	1 17 25.3	9.315
13	22 25 43.28	1.9532	8 21 17.7	8.501	13	23 57 22.05	1.8802	1 8 6.3	9.318
14	22 27 40.40	1.9507	8 12 46.7	8.532	14	23 59 14.84	1.8796	0 58 47.1	9.322
15	22 29 37.37	1.9483	8 4 13.9	8.562	15	0 1 7.60	1.8791	0 49 27.7	9.324
16	22 31 34.20	1.9460	7 55 39.2	8.593	16	0 3 0.33	1.8786	0 40 8.2	9.325
17	22 33 30.89	1.9437	7 47 2.7	8.623	17	0 4 53.03	1.8781	0 30 48.7	9.326
18	22 35 27.45	1.9415	7 38 24.5	8.651	18	0 6 45.70	1.8777	0 21 29.1	9.326
19	22 37 23.87	1.9392	7 29 44.6	8.679	19	0 8 38.35	1.8772	0 12 9.6	9.325
20	22 39 20.15	1.9370	7 21 3.0	8.707	20	0 10 30.97	1.8768	-0 2 50.1	9.325
21	22 41 16.31	1.9349	7 12 19.7	8.734	21	0 12 23.57	1.8766	+0 6 29.4	9.323
22	22 43 12.34	1.9328	7 3 34.9	8.760	22	0 14 16.16	1.8763	+0 15 48.7	9.321
23	22 45 8.24	1.9307	- 6 54 48.5	+8.786	23	0 16 8.73	1.8761	+0 25 7.9	+9.318
APRIL 12.					APRIL 14.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 47 4.02	1.9287	- 6 46 0.6	+8.811	0	0 18 1.29	1.8759	+0 34 26.9	+9.315
1	22 48 59.68	1.9267	6 37 11.2	8.836	1	0 19 53.84	1.8757	0 43 45.7	9.312
2	22 50 55.22	1.9247	6 28 20.3	8.859	2	0 21 46.37	1.8755	0 53 4.3	9.308
3	22 52 50.64	1.9228	6 19 28.1	8.882	3	0 23 38.90	1.8755	1 2 22.6	9.303
4	22 54 45.95	1.9209	6 10 34.4	8.906	4	0 25 31.43	1.8754	1 11 40.6	9.297
5	22 56 41.15	1.9190	6 1 39.4	8.928	5	0 27 23.95	1.8753	1 20 58.2	9.291
6	22 58 36.23	1.9172	5 52 43.1	8.949	6	0 29 16.47	1.8754	1 30 15.5	9.284
7	23 0 31.21	1.9154	5 43 45.5	8.970	7	0 31 9.00	1.8755	1 39 32.3	9.277
8	23 2 26.08	1.9137	5 34 46.7	8.990	8	0 33 1.53	1.8755	1 48 48.7	9.270
9	23 4 20.85	1.9120	5 25 46.7	9.009	9	0 34 54.06	1.8757	1 58 4.7	9.262
10	23 6 15.52	1.9103	5 16 45.6	9.028	10	0 36 46.61	1.8758	2 7 20.1	9.252
11	23 8 10.09	1.9087	5 7 43.3	9.047	11	0 38 39.16	1.8760	2 16 34.9	9.242
12	23 10 4.57	1.9072	4 58 40.0	9.064	12	0 40 31.73	1.8762	2 25 49.1	9.232
13	23 11 58.95	1.9056	4 49 35.6	9.082	13	0 42 24.31	1.8765	2 35 2.7	9.222
14	23 13 53.24	1.9042	4 40 30.2	9.098	14	0 44 16.91	1.8768	2 44 15.7	9.210
15	23 15 47.45	1.9027	4 31 23.8	9.115	15	0 46 9.53	1.8772	2 53 27.9	9.198
16	23 17 41.56	1.9012	4 22 16.4	9.131	16	0 48 2.17	1.8775	3 2 39.5	9.187
17	23 19 35.59	1.8998	4 13 8.1	9.145	17	0 49 54.83	1.8779	3 11 50.3	9.173
18	23 21 29.54	1.8985	4 3 59.0	9.158	18	0 51 47.52	1.8784	3 21 0.3	9.159
19	23 23 23.41	1.8972	3 54 49.1	9.172	19	0 53 40.24	1.8788	3 30 9.4	9.145
20	23 25 17.20	1.8959	3 45 38.3	9.187	20	0 55 32.98	1.8793	3 39 17.7	9.131
21	23 27 10.92	1.8947	3 36 26.7	9.199	21	0 57 25.76	1.8799	3 48 25.1	9.116
22	23 29 4.56	1.8934	3 27 14.4	9.210	22	0 59 18.57	1.8805	3 57 31.6	9.100
23	23 30 58.13	1.8923	3 18 1.5	9.222	23	1 1 11.42	1.8811	4 6 37.1	9.083
24	23 32 51.64	1.8913	- 3 8 47.8	+9.233	24	1 3 4.30	1.8817	+4 15 41.6	+9.067

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 15.					APRIL 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 3 4.30	1.8817	+ 4 15 41.6	+9.067	0	2 34 43.46	1.9478	+11 0 21.2	+7.573
1	1 4 57.23	1.8824	4 24 45.1	9.049	1	2 36 40.39	1.9498	11 7 54.2	7.527
2	1 6 50.19	1.8831	4 33 47.5	9.030	2	2 38 37.44	1.9518	11 15 24.4	7.481
3	1 8 43.20	1.8839	4 42 48.7	9.012	3	2 40 34.61	1.9539	11 22 51.9	7.435
4	1 10 36.26	1.8847	4 51 48.9	8.995	4	2 42 31.91	1.9560	11 30 16.6	7.388
5	1 12 29.36	1.8854	5 0 47.9	8.978	5	2 44 29.33	1.9580	11 37 38.4	7.340
6	1 14 22.51	1.8863	5 9 45.6	8.952	6	2 46 26.87	1.9602	11 44 57.4	7.292
7	1 16 15.71	1.8872	5 18 42.1	8.932	7	2 48 24.55	1.9623	11 52 13.5	7.243
8	1 18 8.97	1.8881	5 27 37.4	8.910	8	2 50 22.35	1.9643	11 59 26.6	7.193
9	1 20 2.28	1.8890	5 36 31.3	8.888	9	2 52 20.27	1.9665	12 6 36.7	7.143
10	1 21 55.65	1.8900	5 45 23.9	8.865	10	2 54 18.33	1.9687	12 13 43.8	7.093
11	1 23 49.08	1.8910	5 54 15.1	8.842	11	2 56 16.52	1.9709	12 20 47.9	7.042
12	1 25 42.57	1.8920	6 0 3 4.9	8.818	12	2 58 14.84	1.9731	12 27 48.9	6.991
13	1 27 36.12	1.8931	6 11 53.2	8.793	13	3 0 13.29	1.9753	12 34 46.8	6.939
14	1 29 29.74	1.8942	6 20 40.1	8.768	14	3 2 11.88	1.9776	12 41 41.6	6.886
15	1 31 23.42	1.8953	6 29 25.4	8.743	15	3 4 10.60	1.9798	12 48 33.1	6.832
16	1 33 17.17	1.8964	6 38 9.2	8.717	16	3 6 9.46	1.9822	12 55 21.5	6.779
17	1 35 10.99	1.8977	6 46 51.4	8.690	17	3 8 8.46	1.9844	13 2 6.6	6.725
18	1 37 4.89	1.8988	6 55 32.0	8.662	18	3 10 7.59	1.9867	13 8 48.5	6.670
19	1 38 58.85	1.9000	7 4 10.9	8.634	19	3 12 6.86	1.9890	13 15 27.0	6.614
20	1 40 52.89	1.9013	7 12 48.1	8.606	20	3 14 6.27	1.9913	13 22 2.2	6.558
21	1 42 47.01	1.9027	7 21 23.6	8.577	21	3 16 5.82	1.9937	13 28 34.0	6.502
22	1 44 41.21	1.9040	7 29 57.3	8.547	22	3 18 5.51	1.9960	13 35 2.4	6.444
23	1 46 35.49	1.9053	+ 7 38 29.2	+8.517	23	3 20 5.34	1.9983	+13 41 27.3	+6.386
APRIL 16.					APRIL 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 48 29.85	1.9067	+ 7 46 59.3	+8.486	0	3 22 5.31	2.0007	+13 47 48.7	+6.327
1	1 50 24.30	1.9082	7 55 27.5	8.454	1	3 24 5.43	2.0032	13 54 6.6	6.269
2	1 52 18.83	1.9096	8 3 53.8	8.422	2	3 26 5.69	2.0055	14 0 21.0	6.210
3	1 54 13.45	1.9111	8 12 18.2	8.390	3	3 28 6.09	2.0078	14 6 31.8	6.149
4	1 56 8.16	1.9126	8 20 40.6	8.357	4	3 30 6.63	2.0102	14 12 38.9	6.088
5	1 58 2.96	1.9141	8 29 1.0	8.323	5	3 32 7.32	2.0127	14 18 42.4	6.028
6	1 59 57.85	1.9156	8 37 19.4	8.289	6	3 34 8.16	2.0152	14 24 42.3	5.967
7	2 1 52.83	1.9172	8 45 35.7	8.253	7	3 36 9.14	2.0176	14 30 38.4	5.908
8	2 3 47.91	1.9188	8 53 49.8	8.218	8	3 38 10.27	2.0200	14 36 30.7	5.841
9	2 5 43.09	1.9205	9 2 1.9	8.182	9	3 40 11.54	2.0225	14 42 19.3	5.778
10	2 7 38.37	1.9222	9 10 11.7	8.145	10	3 42 12.97	2.0250	14 48 4.1	5.714
11	2 9 33.75	1.9238	9 18 19.3	8.108	11	3 44 14.54	2.0274	14 53 45.0	5.650
12	2 11 29.23	1.9255	9 26 24.7	8.071	12	3 46 16.26	2.0299	14 59 22.1	5.585
13	2 13 24.81	1.9273	9 34 27.8	8.033	13	3 48 18.13	2.0323	15 4 55.2	5.519
14	2 15 20.50	1.9291	9 42 28.6	7.993	14	3 50 20.14	2.0348	15 10 24.4	5.453
15	2 17 16.30	1.9308	9 50 27.0	7.954	15	3 52 22.31	2.0373	15 15 49.6	5.387
16	2 19 12.20	1.9326	9 58 23.1	7.914	16	3 54 24.62	2.0398	15 21 10.8	5.320
17	2 21 8.21	1.9344	10 6 16.7	7.873	17	3 56 27.09	2.0423	15 26 28.0	5.253
18	2 23 4.33	1.9363	10 14 7.8	7.832	18	3 58 29.70	2.0448	15 31 41.1	5.184
19	2 25 0.57	1.9382	10 21 56.5	7.790	19	4 0 32.46	2.0473	15 36 50.1	5.116
20	2 26 56.91	1.9400	10 29 42.6	7.747	20	4 2 35.38	2.0498	15 41 55.0	5.047
21	2 28 53.37	1.9420	10 37 26.2	7.705	21	4 4 38.44	2.0523	15 46 55.8	4.977
22	2 30 49.95	1.9440	10 45 7.2	7.661	22	4 6 41.66	2.0548	15 51 52.3	4.907
23	2 32 46.65	1.9459	10 52 45.5	7.617	23	4 8 45.02	2.0573	15 56 44.6	4.836
24	2 34 43.46	1.9478	+11 0 21.2	+7.573	24	4 10 48.54	2.0599	+16 1 32.6	+4.765

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 19.					APRIL 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 10 48.54	2.0599	+16 1 32.6	+4.765	0	5 52 27.87	2.1717	+18 19 22.3	+0.817
1	4 12 52.21	2.0623	16 6 16.4	4.693	1	5 54 38.23	2.1736	18 20 8.6	0.726
2	4 14 56.02	2.0648	16 10 55.8	4.621	2	5 56 48.70	2.1755	18 20 49.4	0.634
3	4 16 59.99	2.0674	16 15 30.9	4.548	3	5 58 59.29	2.1775	18 21 24.7	0.542
4	4 19 4.11	2.0698	16 20 1.6	4.475	4	6 1 10.00	2.1795	18 21 54.5	0.450
5	4 21 8.37	2.0723	16 24 27.9	4.402	5	6 3 20.83	2.1814	18 22 18.7	0.357
6	4 23 12.79	2.0749	16 28 49.8	4.328	6	6 5 31.77	2.1832	18 22 37.3	0.264
7	4 25 17.36	2.0773	16 33 7.2	4.253	7	6 7 42.82	2.1851	18 22 50.4	0.172
8	4 27 22.07	2.0798	16 37 20.1	4.178	8	6 9 53.98	2.1869	18 22 57.9	+0.078
9	4 29 26.94	2.0824	16 41 28.5	4.102	9	6 12 5.25	2.1887	18 22 59.8	-0.016
10	4 31 31.96	2.0848	16 45 32.3	4.026	10	6 14 16.63	2.1905	18 22 56.0	0.110
11	4 33 37.12	2.0872	16 49 31.6	3.949	11	6 16 28.11	2.1923	18 22 46.6	0.203
12	4 35 42.43	2.0897	16 53 26.2	3.872	12	6 18 39.71	2.1942	18 22 31.6	0.297
13	4 37 47.89	2.0922	16 57 16.2	3.794	13	6 20 51.41	2.1958	18 22 10.9	0.392
14	4 39 53.50	2.0947	17 1 1.5	3.717	14	6 23 3.21	2.1976	18 21 44.5	0.487
15	4 41 59.26	2.0972	17 4 42.2	3.638	15	6 25 15.12	2.1993	18 21 12.5	0.582
16	4 44 5.16	2.0996	17 8 18.1	3.559	16	6 27 27.12	2.2009	18 20 34.7	0.677
17	4 46 11.21	2.1021	17 11 49.3	3.479	17	6 29 39.23	2.2026	18 19 51.2	0.772
18	4 48 17.41	2.1045	17 15 15.6	3.399	18	6 31 51.43	2.2042	18 19 2.1	0.867
19	4 50 23.75	2.1069	17 18 37.2	3.320	19	6 34 3.73	2.2058	18 18 7.2	0.963
20	4 52 30.24	2.1093	17 21 54.0	3.239	20	6 36 16.13	2.2074	18 17 6.5	1.059
21	4 54 36.87	2.1117	17 25 5.9	3.157	21	6 38 28.62	2.2089	18 16 0.1	1.154
22	4 56 43.65	2.1142	17 28 12.9	3.076	22	6 40 41.20	2.2105	18 14 48.0	1.251
23	4 58 50.57	2.1165	+17 31 15.0	+2.994	23	6 42 53.88	2.2121	+18 13 30.0	-1.347
APRIL 20.					APRIL 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 0 57.63	2.1188	+17 34 12.2	+2.912	0	6 45 6.65	2.2136	+18 12 6.3	-1.443
1	5 3 4.83	2.1212	17 37 4.4	2.828	1	6 47 19.51	2.2150	18 10 36.8	1.540
2	5 5 12.18	2.1236	17 39 51.6	2.745	2	6 49 32.45	2.2165	18 9 1.5	1.637
3	5 7 19.66	2.1259	17 42 33.8	2.662	3	6 51 45.49	2.2179	18 7 20.4	1.733
4	5 9 27.29	2.1282	17 45 11.0	2.578	4	6 53 58.60	2.2193	18 5 33.5	1.830
5	5 11 35.05	2.1305	17 47 43.1	2.493	5	6 56 11.80	2.2208	18 3 40.8	1.927
6	5 13 42.95	2.1328	17 50 10.2	2.408	6	6 58 25.09	2.2221	18 1 42.3	2.023
7	5 15 50.99	2.1352	17 52 32.1	2.322	7	7 0 38.45	2.2234	17 59 38.0	2.121
8	5 17 59.17	2.1375	17 54 48.9	2.237	8	7 2 51.90	2.2247	17 57 27.8	2.218
9	5 20 7.49	2.1397	17 57 0.6	2.152	9	7 5 5.42	2.2260	17 55 11.8	2.315
10	5 22 15.93	2.1418	17 59 7.1	2.064	10	7 7 19.02	2.2273	17 52 50.0	2.412
11	5 24 24.51	2.1442	18 1 8.3	1.977	11	7 9 32.70	2.2286	17 50 22.3	2.510
12	5 26 33.23	2.1464	18 3 4.4	1.891	12	7 11 46.45	2.2298	17 47 48.8	2.607
13	5 28 42.08	2.1486	18 4 55.2	1.803	13	7 14 0.28	2.2311	17 45 9.5	2.704
14	5 30 51.06	2.1507	18 6 40.8	1.716	14	7 16 14.18	2.2323	17 42 24.3	2.802
15	5 33 0.17	2.1529	18 8 21.1	1.627	15	7 18 28.15	2.2334	17 39 33.2	2.900
16	5 35 9.41	2.1551	18 9 56.0	1.538	16	7 20 42.19	2.2346	17 36 36.3	2.997
17	5 37 18.78	2.1572	18 11 25.7	1.450	17	7 22 56.30	2.2357	17 33 33.6	3.094
18	5 39 28.27	2.1593	18 12 50.0	1.360	18	7 25 10.47	2.2368	17 30 25.0	3.192
19	5 41 37.90	2.1615	18 14 8.9	1.270	19	7 27 24.71	2.2379	17 27 10.6	3.288
20	5 43 47.65	2.1635	18 15 22.4	1.181	20	7 29 39.02	2.2390	17 23 50.4	3.386
21	5 45 57.52	2.1655	18 16 30.6	1.091	21	7 31 53.39	2.2401	17 20 24.3	3.483
22	5 48 7.51	2.1676	18 17 33.3	0.999	22	7 34 7.83	2.2411	17 16 52.4	3.580
23	5 50 17.63	2.1697	18 18 30.5	0.908	23	7 36 22.32	2.2421	17 13 14.7	3.677
24	5 52 27.87	2.1717	+18 19 22.3	+0.817	24	7 38 36.88	2.2432	+17 9 31.1	-3.774

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 23.					APRIL 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 38 36.88	2.2432	+17 9 31.1	-3.774	0	9 27 11.56	2.2780	+12 20 9.8	-8.161
1	7 40 51.50	2.2441	17 5 41.8	3.871	1	9 29 28.26	2.2788	12 11 57.7	8.242
2	7 43 6.17	2.2451	17 1 46.6	3.968	2	9 31 45.01	2.2794	12 3 40.7	8.323
3	7 45 20.91	2.2461	16 57 45.6	4.066	3	9 34 1.79	2.2800	11 55 18.9	8.403
4	7 47 35.70	2.2470	16 53 38.7	4.163	4	9 36 18.61	2.2807	11 46 52.3	8.482
5	7 49 50.55	2.2479	16 49 26.1	4.258	5	9 38 35.47	2.2813	11 38 21.0	8.562
6	7 52 5.45	2.2488	16 45 7.7	4.355	6	9 40 52.37	2.2820	11 29 44.9	8.641
7	7 54 20.40	2.2497	16 40 43.5	4.451	7	9 43 9.31	2.2827	11 21 4.1	8.718
8	7 56 35.41	2.2506	16 36 13.6	4.547	8	9 45 26.30	2.2835	11 12 18.7	8.795
9	7 58 50.47	2.2514	16 31 37.9	4.643	9	9 47 43.33	2.2842	11 3 28.7	8.872
10	8 1 5.58	2.2522	16 26 56.4	4.739	10	9 50 0.40	2.2848	10 54 34.1	8.948
11	8 3 20.74	2.2531	16 22 9.2	4.835	11	9 52 17.51	2.2856	10 45 35.0	9.023
12	8 5 35.95	2.2539	16 17 16.2	4.931	12	9 54 34.67	2.2863	10 36 31.4	9.098
13	8 7 51.21	2.2547	16 12 17.5	5.026	13	9 56 51.87	2.2871	10 27 23.3	9.171
14	8 10 6.51	2.2555	16 7 13.1	5.121	14	9 59 9.12	2.2879	10 18 10.9	9.243
15	8 12 21.87	2.2563	16 2 3.0	5.215	15	10 1 26.42	2.2887	10 8 54.1	9.316
16	8 14 37.27	2.2570	15 56 47.3	5.310	16	10 3 43.76	2.2894	9 59 33.0	9.388
17	8 16 52.71	2.2577	15 51 25.8	5.405	17	10 6 1.15	2.2902	9 50 7.6	9.458
18	8 19 8.20	2.2585	15 45 58.7	5.498	18	10 8 18.58	2.2910	9 40 38.1	9.528
19	8 21 23.73	2.2592	15 40 26.0	5.592	19	10 10 36.07	2.2919	9 31 4.3	9.597
20	8 23 39.31	2.2600	15 34 47.6	5.687	20	10 12 53.61	2.2927	9 21 26.4	9.665
21	8 25 54.93	2.2607	15 29 3.6	5.780	21	10 15 11.19	2.2935	9 11 44.5	9.732
22	8 28 10.60	2.2614	15 23 14.0	5.873	22	10 17 28.83	2.2944	9 1 58.5	9.799
23	8 30 26.30	2.2621	+15 17 18.8	-5.966	23	10 19 46.52	2.2953	+8 52 8.6	-9.865
APRIL 24.					APRIL 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 32 42.05	2.2628	+15 11 18.1	-6.058	0	10 22 4.27	2.2962	+8 42 14.7	-9.930
1	8 34 57.84	2.2635	15 5 11.8	6.151	1	10 24 22.07	2.2972	8 32 17.0	9.994
2	8 37 13.67	2.2641	14 59 0.0	6.243	2	10 26 39.93	2.2981	8 22 15.4	10.057
3	8 39 29.53	2.2648	14 52 42.7	6.334	3	10 28 57.84	2.2990	8 12 10.1	10.120
4	8 41 45.44	2.2655	14 46 19.9	6.425	4	10 31 15.81	2.3001	8 2 1.0	10.182
5	8 44 1.39	2.2661	14 39 51.7	6.516	5	10 33 33.85	2.3011	7 51 48.3	10.242
6	8 46 17.37	2.2667	14 33 18.0	6.607	6	10 35 51.94	2.3020	7 41 32.0	10.302
7	8 48 33.39	2.2674	14 26 38.9	6.697	7	10 38 10.09	2.3031	7 31 12.1	10.360
8	8 50 49.46	2.2681	14 19 54.4	6.787	8	10 40 28.31	2.3042	7 20 48.8	10.418
9	8 53 5.56	2.2686	14 13 4.5	6.876	9	10 42 46.59	2.3052	7 10 22.0	10.474
10	8 55 21.69	2.2693	14 6 9.3	6.965	10	10 45 4.93	2.3063	6 59 51.9	10.530
11	8 57 37.87	2.2699	13 59 8.7	7.053	11	10 47 23.34	2.3074	6 49 18.4	10.585
12	8 59 54.08	2.2705	13 52 2.9	7.141	12	10 49 41.82	2.3086	6 38 41.7	10.638
13	9 2 10.33	2.2712	13 44 51.8	7.228	13	10 52 0.37	2.3097	6 28 1.8	10.691
14	9 4 26.62	2.2718	13 37 35.5	7.316	14	10 54 18.98	2.3108	6 17 18.8	10.743
15	9 6 42.94	2.2724	13 30 13.9	7.403	15	10 56 37.67	2.3121	6 6 32.6	10.794
16	9 8 59.31	2.2731	13 22 47.1	7.489	16	10 58 56.43	2.3133	5 55 43.5	10.843
17	9 11 15.71	2.2737	13 15 15.2	7.575	17	11 1 15.27	2.3146	5 44 51.4	10.892
18	9 13 32.15	2.2743	13 7 38.1	7.661	18	11 3 34.18	2.3158	5 33 56.5	10.939
19	9 15 48.62	2.2748	12 59 55.9	7.745	19	11 5 53.16	2.3171	5 22 58.7	10.986
20	9 18 5.13	2.2755	12 52 8.7	7.828	20	11 8 12.23	2.3185	5 11 58.2	11.031
21	9 20 21.68	2.2762	12 44 16.5	7.912	21	11 10 31.38	2.3198	5 0 55.0	11.075
22	9 22 38.27	2.2768	12 36 19.2	7.996	22	11 12 50.61	2.3211	4 49 49.2	11.118
23	9 24 54.90	2.2774	12 28 17.0	8.078	23	11 15 9.91	2.3225	4 38 40.8	11.160
24	9 27 11.56	2.2780	+12 20 9.8	-8.161	24	11 17 29.31	2.3240	+4 27 30.0	-11.200

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
APRIL 27.					APRIL 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 17 29.31	2.3240	+4 27 30.0	-11.200	0	13 11 6.54	2.4183	-4 52 30.9	-11.590
1	11 19 48.79	2.3253	4 16 16.8	11.240	1	13 13 31.71	2.4207	5 4 5.5	11.562
2	11 22 8.35	2.3268	4 5 1.2	11.279	2	13 15 57.03	2.4232	5 15 38.4	11.532
3	11 24 28.01	2.3283	3 53 43.3	11.317	3	13 18 22.49	2.4256	5 27 9.4	11.501
4	11 26 47.75	2.3298	3 42 23.2	11.353	4	13 20 48.10	2.4280	5 38 38.5	11.468
5	11 29 7.59	2.3313	3 31 1.0	11.387	5	13 23 13.85	2.4304	5 50 5.6	11.434
6	11 31 27.51	2.3328	3 19 36.8	11.421	6	13 25 39.75	2.4329	6 1 30.6	11.398
7	11 33 47.53	2.3345	3 8 10.5	11.453	7	13 28 5.80	2.4353	6 12 53.4	11.361
8	11 36 7.65	2.3361	2 56 42.4	11.483	8	13 30 31.99	2.4377	6 24 13.9	11.323
9	11 38 27.86	2.3377	2 45 12.5	11.513	9	13 32 58.33	2.4402	6 35 32.1	11.282
10	11 40 48.17	2.3394	2 33 40.8	11.542	10	13 35 24.82	2.4427	6 46 47.7	11.239
11	11 43 8.59	2.3411	2 22 7.4	11.570	11	13 37 51.45	2.4451	6 58 0.8	11.196
12	11 45 29.10	2.3427	2 10 32.4	11.596	12	13 40 18.23	2.4475	7 9 11.2	11.150
13	11 47 49.71	2.3444	1 58 55.9	11.621	13	13 42 45.15	2.4499	7 20 18.8	11.103
14	11 50 10.43	2.3462	1 47 17.9	11.644	14	13 45 12.22	2.4523	7 31 23.6	11.056
15	11 52 31.26	2.3480	1 35 38.6	11.666	15	13 47 39.44	2.4549	7 42 25.5	11.006
16	11 54 52.19	2.3498	1 23 58.0	11.686	16	13 50 6.81	2.4573	7 53 24.3	10.953
17	11 57 13.23	2.3516	1 12 16.3	11.706	17	13 52 34.31	2.4597	8 4 19.9	10.901
18	11 59 34.38	2.3535	1 0 33.3	11.724	18	13 55 1.97	2.4622	8 15 12.4	10.847
19	12 1 55.65	2.3553	0 48 49.4	11.740	19	13 57 29.77	2.4645	8 26 1.5	10.790
20	12 4 17.02	2.3572	0 37 4.5	11.756	20	13 59 57.71	2.4669	8 36 47.2	10.732
21	12 6 38.51	2.3592	0 25 18.7	11.770	21	14 2 25.80	2.4693	8 47 29.4	10.673
22	12 9 0.12	2.3611	0 13 32.1	11.782	22	14 4 54.03	2.4717	8 58 8.0	10.612
23	12 11 21.84	2.3630	+0 1 44.8	-11.793	23	14 7 22.40	2.4740	-9 8 42.9	-10.550
APRIL 28.					APRIL 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 13 43.68	2.3650	-0 10 3.1	-11.803	0	14 9 50.91	2.4763	-9 19 14.0	-10.487
1	12 16 5.64	2.3670	0 21 51.5	11.811	1	14 12 19.56	2.4787	9 29 41.3	10.422
2	12 18 27.72	2.3691	0 33 40.4	11.818	2	14 14 48.35	2.4810	9 40 4.6	10.355
3	12 20 49.93	2.3712	0 45 29.7	11.824	3	14 17 17.28	2.4833	9 50 23.9	10.287
4	12 23 12.26	2.3732	0 57 19.3	11.828	4	14 19 46.35	2.4856	10 0 39.0	10.218
5	12 25 34.71	2.3752	1 9 9.0	11.829	5	14 22 15.55	2.4878	10 10 50.0	10.147
6	12 27 57.28	2.3773	1 20 58.8	11.830	6	14 24 44.89	2.4901	10 20 56.6	10.073
7	12 30 19.99	2.3796	1 32 48.6	11.830	7	14 27 14.36	2.4923	10 30 58.8	10.000
8	12 32 42.83	2.3817	1 44 38.4	11.828	8	14 29 43.96	2.4944	10 40 56.6	9.925
9	12 35 5.79	2.3838	1 56 28.0	11.825	9	14 32 13.69	2.4965	10 50 49.8	9.848
10	12 37 28.89	2.3861	2 8 17.4	11.820	10	14 34 43.54	2.4986	11 0 38.4	9.771
11	12 39 52.12	2.3883	2 20 6.4	11.813	11	14 37 13.52	2.5007	11 10 22.3	9.691
12	12 42 15.48	2.3905	2 31 55.0	11.806	12	14 39 43.63	2.5029	11 20 1.3	9.610
13	12 44 38.98	2.3927	2 43 43.1	11.796	13	14 42 13.87	2.5050	11 29 35.5	9.528
14	12 47 2.61	2.3949	2 55 30.5	11.785	14	14 44 44.23	2.5070	11 39 4.7	9.444
15	12 49 26.37	2.3972	3 7 17.3	11.773	15	14 47 14.71	2.5089	11 48 28.8	9.359
16	12 51 50.27	2.3996	3 19 3.2	11.758	16	14 49 45.30	2.5107	11 57 47.8	9.272
17	12 54 14.32	2.4019	3 30 48.3	11.742	17	14 52 16.00	2.5127	12 7 1.5	9.185
18	12 56 38.50	2.4042	3 42 32.3	11.725	18	14 54 46.82	2.5146	12 16 10.0	9.097
19	12 59 2.82	2.4065	3 54 15.3	11.706	19	14 57 17.75	2.5164	12 25 13.2	9.008
20	13 1 27.28	2.4088	4 5 57.1	11.687	20	14 59 48.79	2.5182	12 34 10.9	8.916
21	13 3 51.88	2.4112	4 17 37.7	11.665	21	15 2 19.93	2.5198	12 43 3.1	8.823
22	13 6 16.62	2.4136	4 29 16.9	11.642	22	15 4 51.17	2.5216	12 51 49.7	8.729
23	13 8 41.51	2.4160	4 40 54.7	11.617	23	15 7 22.52	2.5233	13 0 30.6	8.634
24	13 11 6.54	2.4183	-4 52 30.9	-11.590	24	15 9 53.96	2.5248	-13 9 5.8	-8.538

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 1.					MAY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 9 53.96	2.5248	-13 9 5.8	-8.538	0	17 11 47.69	2.5269	-17 51 9.6	-2.983
1	15 12 25.50	2.5264	13 17 35.2	8.442	1	17 14 19.25	2.5252	17 54 4.8	2.858
2	15 14 57.13	2.5279	13 25 58.8	8.343	2	17 16 50.71	2.5233	17 56 52.5	2.733
3	15 17 28.85	2.5294	13 34 16.4	8.243	3	17 19 22.05	2.5213	17 59 32.7	2.607
4	15 20 0.66	2.5308	13 42 27.9	8.143	4	17 21 53.27	2.5193	18 2 5.3	2.481
5	15 22 32.55	2.5321	13 50 33.5	8.042	5	17 24 24.37	2.5172	18 4 30.4	2.356
6	15 25 4.51	2.5333	13 58 32.9	7.938	6	17 26 55.34	2.5151	18 6 48.0	2.231
7	15 27 36.55	2.5347	14 6 26.0	7.834	7	17 29 26.18	2.5128	18 8 58.1	2.107
8	15 30 8.67	2.5359	14 14 13.0	7.730	8	17 31 56.88	2.5105	18 11 0.8	1.983
9	15 32 40.86	2.5370	14 21 53.6	7.624	9	17 34 27.44	2.5081	18 12 56.0	1.858
10	15 35 13.11	2.5380	14 29 27.9	7.518	10	17 36 57.85	2.5056	18 14 43.7	1.733
11	15 37 45.42	2.5391	14 36 55.7	7.409	11	17 39 28.11	2.5030	18 16 23.9	1.608
12	15 40 17.80	2.5401	14 44 17.0	7.301	12	17 41 58.21	2.5003	18 17 56.7	1.485
13	15 42 50.23	2.5409	14 51 31.8	7.192	13	17 44 28.15	2.4977	18 19 22.1	1.361
14	15 45 22.71	2.5417	14 58 40.0	7.081	14	17 46 57.93	2.4949	18 20 40.0	1.237
15	15 47 55.24	2.5425	15 5 41.5	6.970	15	17 49 27.54	2.4921	18 21 50.6	1.115
16	15 50 27.81	2.5432	15 12 36.4	6.858	16	17 51 56.98	2.4892	18 22 53.8	0.992
17	15 53 0.42	2.5438	15 19 24.5	6.745	17	17 54 26.24	2.4862	18 23 49.6	0.869
18	15 55 33.07	2.5444	15 26 5.8	6.631	18	17 56 55.32	2.4831	18 24 38.1	0.748
19	15 58 5.75	2.5449	15 32 40.2	6.517	19	17 59 24.21	2.4799	18 25 19.3	0.627
20	16 0 38.46	2.5453	15 39 7.8	6.403	20	18 1 52.91	2.4767	18 25 53.3	0.506
21	16 3 11.19	2.5457	15 45 28.5	6.287	21	18 4 21.42	2.4735	18 26 20.0	0.385
22	16 5 43.94	2.5459	15 51 42.2	6.169	22	18 6 49.73	2.4702	18 26 39.5	0.264
23	16 8 16.70	2.5462	-15 57 48.8	-6.052	23	18 9 17.85	2.4668	-18 26 51.7	-0.144
MAY 2.					MAY 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 10 49.48	2.5463	-16 3 48.4	-5.934	0	18 11 45.75	2.4633	-18 26 56.8	-0.026
1	16 13 22.26	2.5464	16 9 40.9	5.816	1	18 14 13.45	2.4598	18 26 54.8	+0.093
2	16 15 55.05	2.5464	16 15 26.3	5.697	2	18 16 40.93	2.4563	18 26 45.6	0.212
3	16 18 27.83	2.5463	16 21 4.6	5.577	3	18 19 8.20	2.4527	18 26 29.4	0.329
4	16 21 0.61	2.5462	16 26 35.6	5.457	4	18 21 35.25	2.4489	18 26 6.1	0.447
5	16 23 33.38	2.5460	16 31 59.4	5.337	5	18 24 2.07	2.4452	18 25 35.8	0.563
6	16 26 6.13	2.5457	16 37 16.0	5.216	6	18 26 28.67	2.4414	18 24 58.6	0.678
7	16 28 38.86	2.5453	16 42 25.3	5.094	7	18 28 55.04	2.4376	18 24 14.4	0.794
8	16 31 11.57	2.5449	16 47 27.3	4.972	8	18 31 21.18	2.4337	18 23 23.3	0.909
9	16 33 44.25	2.5443	16 52 22.0	4.851	9	18 33 47.08	2.4297	18 22 25.3	1.023
10	16 36 16.89	2.5437	16 57 9.4	4.728	10	18 36 12.74	2.4257	18 21 20.5	1.137
11	16 38 49.50	2.5431	17 1 49.3	4.603	11	18 38 38.16	2.4216	18 20 8.9	1.250
12	16 41 22.06	2.5423	17 6 21.8	4.480	12	18 41 3.33	2.4174	18 18 50.5	1.363
13	16 43 54.57	2.5415	17 10 46.9	4.357	13	18 43 28.25	2.4133	18 17 25.4	1.474
14	16 46 27.04	2.5406	17 15 4.6	4.233	14	18 45 52.93	2.4092	18 15 53.6	1.585
15	16 48 59.44	2.5395	17 19 14.8	4.108	15	18 48 17.35	2.4048	18 14 15.2	1.695
16	16 51 31.78	2.5384	17 23 17.5	3.983	16	18 50 41.51	2.4005	18 12 30.2	1.804
17	16 54 4.05	2.5373	17 27 12.8	3.859	17	18 53 5.41	2.3962	18 10 38.7	1.913
18	16 56 36.26	2.5361	17 31 0.6	3.734	18	18 55 29.06	2.3919	18 8 40.7	2.022
19	16 59 8.38	2.5347	17 34 40.9	3.609	19	18 57 52.44	2.3874	18 6 36.1	2.129
20	17 1 40.42	2.5333	17 38 13.7	3.483	20	19 0 15.55	2.3830	18 4 25.2	2.235
21	17 4 12.38	2.5319	17 41 38.9	3.358	21	19 2 38.40	2.3786	18 2 7.9	2.341
22	17 6 44.25	2.5303	17 44 56.7	3.233	22	19 5 0.98	2.3740	17 59 44.3	2.446
23	17 9 16.02	2.5287	17 48 6.9	3.108	23	19 7 23.28	2.3694	17 57 14.4	2.550
24	17 11 47.69	2.5269	-17 51 9.6	-2.983	24	19 9 45.31	2.3648	-17 54 38.3	+2.668

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.					
MAY 5.							MAY 7.											
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''		
0	19	9	45.31	2.3648	-17	54	38.3	+2.653	0	20	57	42.02	2.1331	-14	3	58.0	+6.628	
1	19	12	7.06	2.3602	17	51	56.0	2.757	1	20	59	49.87	2.1285	13	57	18.5	6.689	
2	19	14	28.54	2.3556	17	49	7.5	2.858	2	21	1	57.44	2.1239	13	50	35.3	6.751	
3	19	16	49.73	2.3509	17	46	13.0	2.959	3	21	4	4.74	2.1194	13	43	48.4	6.811	
4	19	19	10.65	2.3462	17	43	12.4	3.060	4	21	6	11.77	2.1149	13	36	58.0	6.870	
5	19	21	31.28	2.3414	17	40	5.8	3.159	5	21	8	18.53	2.1105	13	30	4.0	6.929	
6	19	23	51.62	2.3367	17	36	53.3	3.257	6	21	10	25.03	2.1060	13	23	6.5	6.987	
7	19	26	11.68	2.3320	17	33	34.9	3.355	7	21	12	31.25	2.1016	13	16	5.6	7.043	
8	19	28	31.46	2.3272	17	30	10.7	3.452	8	21	14	37.22	2.0972	13	9	1.3	7.100	
9	19	30	50.95	2.3223	17	26	40.6	3.549	9	21	16	42.92	2.0928	13	1	53.6	7.156	
10	19	33	10.14	2.3175	17	23	4.8	3.644	10	21	18	48.36	2.0885	12	54	42.6	7.211	
11	19	35	29.05	2.3127	17	19	23.3	3.738	11	21	20	53.54	2.0842	12	47	28.3	7.264	
12	19	37	47.66	2.3078	17	15	36.2	3.832	12	21	22	58.46	2.0799	12	40	10.9	7.317	
13	19	40	5.99	2.3030	17	11	43.5	3.925	13	21	25	3.13	2.0757	12	32	50.3	7.369	
14	19	42	24.02	2.2980	17	7	45.2	4.017	14	21	27	7.55	2.0716	12	25	26.6	7.421	
15	19	44	41.75	2.2931	17	3	41.4	4.108	15	21	29	11.72	2.0674	12	17	59.8	7.472	
16	19	46	59.19	2.2882	16	59	32.2	4.198	16	21	31	15.64	2.0632	12	10	30.0	7.522	
17	19	49	16.34	2.2833	16	55	17.6	4.287	17	21	33	19.31	2.0592	12	2	57.2	7.571	
18	19	51	33.19	2.2784	16	50	57.7	4.376	18	21	35	22.74	2.0552	11	55	21.5	7.619	
19	19	53	49.75	2.2735	16	46	32.5	4.463	19	21	37	25.93	2.0512	11	47	42.9	7.667	
20	19	56	6.01	2.2685	16	42	2.1	4.550	20	21	39	28.88	2.0472	11	40	1.4	7.714	
21	19	58	21.97	2.2636	16	37	26.5	4.637	21	21	41	31.59	2.0432	11	32	17.2	7.760	
22	20	0	37.64	2.2587	16	32	45.7	4.722	22	21	43	34.06	2.0393	11	24	30.2	7.806	
23	20	2	53.01	2.2537	-16	27	59.9	+4.805	23	21	45	36.31	2.0355	-11	16	40.5	+7.851	
MAY 6.							MAY 8.											
0	20	5	8.09	2.2188	-16	23	9.1	+4.888	0	21	47	38.32	2.0317	-11	8	48.1	+7.895	
1	20	7	22.87	2.2138	16	18	13.3	4.971	1	21	49	40.11	2.0279	11	0	53.1	7.938	
2	20	9	37.35	2.2388	16	13	12.6	5.052	2	21	51	41.67	2.0241	10	52	55.6	7.980	
3	20	11	51.53	2.2339	16	8	7.0	5.133	3	21	53	43.00	2.0204	10	44	55.5	8.022	
4	20	14	5.42	2.2290	16	2	56.6	5.213	4	21	55	44.12	2.0167	10	36	52.9	8.064	
5	20	16	19.01	2.2241	15	57	41.5	5.292	5	21	57	45.01	2.0131	10	28	47.8	8.104	
6	20	18	32.31	2.2192	15	52	21.6	5.370	6	21	59	45.69	2.0096	10	20	40.4	8.144	
7	20	20	45.31	2.2142	15	46	57.1	5.447	7	22	1	46.16	2.0061	10	12	30.5	8.183	
8	20	22	58.01	2.2093	15	41	28.0	5.523	8	22	3	46.42	2.0026	10	4	18.4	8.221	
9	20	25	10.43	2.2045	15	35	54.3	5.599	9	22	5	46.47	1.9991	9	56	4.0	8.259	
10	20	27	22.55	2.1996	15	30	16.1	5.673	10	22	7	46.31	1.9957	9	47	47.3	8.296	
11	20	29	34.38	2.1947	15	24	33.5	5.747	11	22	9	45.95	1.9923	9	39	28.5	8.332	
12	20	31	45.92	2.1899	15	18	46.5	5.820	12	22	11	45.39	1.9890	9	31	7.5	8.367	
13	20	33	57.17	2.1851	15	12	55.1	5.892	13	22	13	44.63	1.9857	9	22	44.4	8.402	
14	20	36	8.13	2.1802	15	6	59.4	5.963	14	22	15	43.68	1.9825	9	14	19.2	8.437	
15	20	38	18.80	2.1754	15	0	59.5	6.033	15	22	17	42.53	1.9793	9	5	52.0	8.471	
16	20	40	29.18	2.1706	14	54	55.5	6.102	16	22	19	41.19	1.9762	8	57	22.7	8.504	
17	20	42	39.27	2.1658	14	48	47.3	6.172	17	22	21	39.67	1.9731	8	48	51.5	8.536	
18	20	44	49.08	2.1612	14	42	34.9	6.239	18	22	23	37.96	1.9700	8	40	18.4	8.567	
19	20	46	58.61	2.1564	14	36	18.6	6.305	19	22	25	36.07	1.9670	8	31	43.4	8.598	
20	20	49	7.85	2.1517	14	29	58.3	6.372	20	22	27	34.00	1.9640	8	23	6.6	8.628	
21	20	51	16.81	2.1470	14	23	34.0	6.437	21	22	29	31.75	1.9611	8	14	28.0	8.658	
22	20	53	25.49	2.1424	14	17	5.8	6.502	22	22	31	29.33	1.9582	8	5	47.6	8.687	
23	20	55	33.90	2.1377	14	10	33.8	6.565	23	22	33	26.74	1.9554	7	57	5.5	8.716	
24	20	57	42.02	2.1331	-14	3	58.0	+6.628	24	22	35	23.98	1.9526	-	7	48	21.7	+8.748

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 9.					MAY 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 35 23.98	1.9526	-7 48 21.7	+8.743	0	0 6 48.04	1.8736	-0 28 3.7	+9.383
1	22 37 21.05	1.9498	7 39 36.3	8.771	1	0 8 40.44	1.8731	0 18 40.8	9.382
2	22 39 17.96	1.9472	7 30 49.2	8.797	2	0 10 32.81	1.8727	-0 9 17.9	9.382
3	22 41 14.71	1.9445	7 22 0.6	8.823	3	0 12 25.16	1.8722	+0 0 5.0	9.380
4	22 43 11.30	1.9419	7 13 10.4	8.849	4	0 14 17.48	1.8718	0 9 27.7	9.378
5	22 45 7.74	1.9394	7 4 18.7	8.873	5	0 16 9.78	1.8715	0 18 50.3	9.375
6	22 47 4.03	1.9368	6 55 25.6	8.897	6	0 18 2.06	1.8713	0 28 12.7	9.372
7	22 49 0.16	1.9343	6 46 31.1	8.921	7	0 19 54.33	1.8710	0 37 34.9	9.368
8	22 50 56.15	1.9320	6 37 35.1	8.944	8	0 21 46.58	1.8707	0 46 56.9	9.364
9	22 52 52.00	1.9297	6 28 37.8	8.966	9	0 23 38.82	1.8706	0 56 18.6	9.359
10	22 54 47.71	1.9273	6 19 39.2	8.987	10	0 25 31.05	1.8705	1 5 40.0	9.354
11	22 56 43.27	1.9250	6 10 39.3	9.008	11	0 27 23.28	1.8704	1 15 1.1	9.348
12	22 58 38.71	1.9228	6 1 38.2	9.028	12	0 29 15.50	1.8703	1 24 21.8	9.342
13	23 0 34.01	1.9207	5 52 35.9	9.048	13	0 31 7.72	1.8704	1 33 42.1	9.335
14	23 2 29.19	1.9185	5 43 32.4	9.067	14	0 32 59.95	1.8704	1 43 2.0	9.328
15	23 4 24.23	1.9163	5 34 27.8	9.086	15	0 34 52.17	1.8705	1 52 21.5	9.320
16	23 6 19.15	1.9143	5 25 22.1	9.104	16	0 36 44.41	1.8707	2 1 40.4	9.311
17	23 8 13.95	1.9123	5 16 15.3	9.122	17	0 38 36.65	1.8708	2 10 58.8	9.302
18	23 10 8.63	1.9104	5 7 7.5	9.138	18	0 40 28.91	1.8711	2 20 16.6	9.292
19	23 12 3.20	1.9086	4 57 58.7	9.155	19	0 42 21.18	1.8713	2 29 33.9	9.282
20	23 13 57.66	1.9067	4 48 48.9	9.171	20	0 44 13.47	1.8716	2 38 50.5	9.272
21	23 15 52.00	1.9048	4 39 38.2	9.185	21	0 46 5.77	1.8719	2 48 6.5	9.260
22	23 17 46.24	1.9032	4 30 26.7	9.200	22	0 47 58.10	1.8724	2 57 21.7	9.248
23	23 19 40.38	1.9014	-4 21 14.2	+9.214	23	0 49 50.46	1.8728	+3 6 36.3	+9.237
MAY 10.					MAY 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 21 34.41	1.8997	-4 12 1.0	+9.227	0	0 51 42.84	1.8732	+3 15 50.1	+9.223
1	23 23 28.35	1.8982	4 2 47.0	9.240	1	0 53 35.25	1.8737	3 25 3.1	9.210
2	23 25 22.19	1.8965	3 53 32.2	9.252	2	0 55 27.69	1.8743	3 34 15.3	9.197
3	23 27 15.93	1.8950	3 44 16.7	9.264	3	0 57 20.17	1.8749	3 43 26.7	9.182
4	23 29 9.59	1.8935	3 35 0.5	9.276	4	0 59 12.68	1.8755	- 3 52 37.1	9.166
5	23 31 3.15	1.8921	3 25 43.6	9.286	5	1 1 5.23	1.8762	4 1 46.6	9.151
6	23 32 56.64	1.8907	3 16 26.2	9.296	6	1 2 57.82	1.8769	4 10 55.2	9.135
7	23 34 50.04	1.8893	3 7 8.1	9.306	7	1 4 50.46	1.8777	4 20 2.8	9.117
8	23 36 43.36	1.8880	2 57 49.5	9.315	8	1 6 43.14	1.8784	4 29 9.3	9.101
9	23 38 36.60	1.8868	2 48 30.3	9.323	9	1 8 35.87	1.8792	4 38 14.9	9.083
10	23 40 29.77	1.8857	2 39 10.7	9.330	10	1 10 28.65	1.8801	4 47 19.3	9.064
11	23 42 22.88	1.8845	2 29 50.7	9.337	11	1 12 21.48	1.8810	4 56 22.6	9.046
12	23 44 15.91	1.8833	2 20 30.2	9.345	12	1 14 14.37	1.8819	5 5 24.8	9.027
13	23 46 8.88	1.8823	2 11 9.3	9.351	13	1 16 7.31	1.8828	5 14 25.8	9.006
14	23 48 1.79	1.8812	2 1 48.1	9.357	14	1 18 0.31	1.8839	5 23 25.5	8.985
15	23 49 54.63	1.8802	1 52 26.5	9.362	15	1 19 53.38	1.8850	5 32 24.0	8.964
16	23 51 47.42	1.8794	1 43 4.7	9.366	16	1 21 46.51	1.8861	5 41 21.2	8.942
17	23 53 40.16	1.8786	1 33 42.6	9.370	17	1 23 39.71	1.8872	5 50 17.1	8.920
18	23 55 32.85	1.8778	1 24 20.3	9.373	18	1 25 32.97	1.8883	5 59 11.6	8.897
19	23 57 25.49	1.8769	1 14 57.8	9.376	19	1 27 26.31	1.8896	6 8 4.8	8.874
20	23 59 18.08	1.8762	1 5 35.2	9.378	20	1 29 19.72	1.8908	6 16 56.5	8.850
21	0 1 10.63	1.8755	0 56 12.4	9.380	21	1 31 13.20	1.8919	6 25 46.8	8.826
22	0 3 3.14	1.8748	0 46 49.6	9.381	22	1 33 6.75	1.8933	6 34 35.6	8.800
23	0 4 55.61	1.8742	0 37 26.7	9.382	23	1 35 0.39	1.8947	6 43 22.8	8.774
24	0 6 48.04	1.8736	-0 28 3.7	+9.383	24	1 36 54.11	1.8960	+6 52 8.5	+8.748

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 13.					MAY 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 36 54.11	1.8960	+ 6 52 8.5	+8.748	0	3 10 2.58	1.9942	+13 10 43.6	+6.798
1	1 38 47.91	1.8974	7 0 52.6	8.722	1	3 12 2.31	1.9968	13 17 29.8	6.743
2	1 40 41.80	1.8988	7 9 35.1	8.694	2	3 14 2.19	1.9993	13 24 12.7	6.687
3	1 42 35.77	1.9003	7 18 15.9	8.666	3	3 16 2.22	2.0018	13 30 52.2	6.630
4	1 44 29.83	1.9018	7 26 55.0	8.637	4	3 18 2.41	2.0044	13 37 28.3	6.572
5	1 46 23.99	1.9033	7 35 32.4	8.608	5	3 20 2.75	2.0070	13 44 0.9	6.515
6	1 48 18.23	1.9048	7 44 8.0	8.579	6	3 22 3.25	2.0096	13 50 30.1	6.457
7	1 50 12.57	1.9065	7 52 41.9	8.549	7	3 24 3.90	2.0122	13 56 55.7	6.398
8	1 52 7.01	1.9082	8 1 13.9	8.518	8	3 26 4.71	2.0148	14 3 17.8	6.338
9	1 54 1.55	1.9098	8 9 44.0	8.486	9	3 28 5.68	2.0174	14 9 36.3	6.278
10	1 55 56.18	1.9114	8 18 12.2	8.454	10	3 30 6.80	2.0201	14 15 51.2	6.217
11	1 57 50.92	1.9132	8 26 38.5	8.422	11	3 32 8.09	2.0228	14 22 2.4	6.156
12	1 59 45.77	1.9150	8 35 2.8	8.388	12	3 34 9.53	2.0253	14 28 9.9	6.094
13	2 1 40.72	1.9168	8 43 25.1	8.355	13	3 36 11.13	2.0280	14 34 13.7	6.032
14	2 3 35.78	1.9185	8 51 45.4	8.321	14	3 38 12.89	2.0306	14 40 13.7	5.969
15	2 5 30.94	1.9203	9 0 3.6	8.286	15	3 40 14.80	2.0333	14 46 10.0	5.906
16	2 7 26.22	1.9222	9 8 19.7	8.250	16	3 42 16.88	2.0360	14 52 2.4	5.841
17	2 9 21.61	1.9241	9 16 33.6	8.213	17	3 44 19.12	2.0386	14 57 50.9	5.776
18	2 11 17.11	1.9260	9 24 45.3	8.177	18	3 46 21.51	2.0412	15 3 35.5	5.710
19	2 13 12.73	1.9280	9 32 54.8	8.140	19	3 48 24.07	2.0439	15 9 16.1	5.644
20	2 15 8.47	1.9300	9 41 2.1	8.102	20	3 50 26.78	2.0465	15 14 52.8	5.578
21	2 17 4.33	1.9319	9 49 7.0	8.063	21	3 52 29.65	2.0493	15 20 25.5	5.512
22	2 19 0.30	1.9339	9 57 9.7	8.024	22	3 54 32.69	2.0519	15 25 54.2	5.444
23	2 20 56.40	1.9361	+10 5 9.9	+7.984	23	3 56 35.88	2.0545	+15 31 18.8	+5.375
MAY 14.					MAY 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 22 52.68	1.9382	+10 13 7.8	+7.944	0	3 58 39.23	2.0572	+15 36 39.2	+5.306
1	2 24 48.98	1.9403	10 21 3.2	7.903	1	4 0 42.74	2.0598	15 41 55.5	5.237
2	2 26 45.46	1.9423	10 28 56.2	7.862	2	4 2 46.41	2.0625	15 47 7.7	5.167
3	2 28 42.06	1.9445	10 36 46.7	7.820	3	4 4 50.24	2.0652	15 52 15.6	5.096
4	2 30 38.80	1.9467	10 44 34.6	7.777	4	4 6 54.23	2.0678	15 57 19.2	5.025
5	2 32 35.66	1.9488	10 52 19.9	7.733	5	4 8 58.38	2.0704	16 2 18.6	4.954
6	2 34 32.66	1.9511	11 0 2.6	7.690	6	4 11 2.68	2.0730	16 7 13.7	4.882
7	2 36 29.79	1.9533	11 7 42.7	7.646	7	4 13 7.14	2.0757	16 12 4.4	4.809
8	2 38 27.06	1.9556	11 15 20.1	7.600	8	4 15 11.76	2.0783	16 16 50.8	4.736
9	2 40 24.46	1.9578	11 22 54.7	7.555	9	4 17 16.54	2.0809	16 21 32.7	4.662
10	2 42 22.00	1.9601	11 30 26.7	7.509	10	4 19 21.47	2.0835	16 26 10.2	4.588
11	2 44 19.67	1.9624	11 37 55.8	7.462	11	4 21 26.56	2.0862	16 30 43.3	4.513
12	2 46 17.49	1.9648	11 45 22.1	7.414	12	4 23 31.81	2.0888	16 35 11.8	4.437
13	2 48 15.45	1.9672	11 52 45.5	7.367	13	4 25 37.21	2.0913	16 39 35.8	4.362
14	2 50 13.55	1.9695	12 0 6.1	7.318	14	4 27 42.77	2.0939	16 43 55.2	4.286
15	2 52 11.79	1.9719	12 7 23.6	7.268	15	4 29 48.48	2.0964	16 48 10.1	4.209
16	2 54 10.18	1.9743	12 14 38.2	7.218	16	4 31 54.34	2.0989	16 52 20.3	4.131
17	2 56 8.71	1.9768	12 21 49.8	7.168	17	4 34 0.35	2.1015	16 56 25.8	4.062
18	2 58 7.39	1.9793	12 28 58.3	7.117	18	4 36 6.52	2.1040	17 0 26.6	3.974
19	3 0 6.22	1.9817	12 36 3.8	7.065	19	4 38 12.83	2.1065	17 4 22.7	3.896
20	3 2 5.19	1.9841	12 43 6.1	7.012	20	4 40 19.30	2.1091	17 8 14.1	3.816
21	3 4 4.31	1.9866	12 50 5.3	6.960	21	4 42 25.92	2.1115	17 12 0.6	3.736
22	3 6 3.58	1.9892	12 57 1.3	6.907	22	4 44 32.68	2.1139	17 15 42.4	3.656
23	3 8 3.01	1.9917	13 3 54.1	6.853	23	4 46 39.59	2.1164	17 19 19.3	3.575
24	3 10 2.58	1.9942	+13 10 43.6	+6.798	24	4 48 46.65	2.1188	+17 22 51.4	+3.494

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 17.					MAY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 48 46.65	2.1188	+17 22 51.4	+3.494	0	6 32 50.74	2.2069	+18 29 19.2	-0.842
1	4 50 53.85	2.1212	17 26 18.6	3.412	1	6 35 3.19	2.2080	18 28 25.8	0.938
2	4 53 1.20	2.1237	17 29 40.8	3.329	2	6 37 15.70	2.2090	18 27 26.7	1.034
3	4 55 8.69	2.1260	17 32 58.1	3.247	3	6 39 28.27	2.2100	18 26 21.7	1.131
4	4 57 16.32	2.1283	17 36 10.4	3.163	4	6 41 40.90	2.2111	18 25 11.0	1.227
5	4 59 24.09	2.1307	17 39 17.7	3.080	5	6 43 53.60	2.2121	18 23 54.5	1.323
6	5 1 32.00	2.1331	17 42 20.0	2.996	6	6 46 6.35	2.2130	18 22 32.2	1.420
7	5 3 40.05	2.1353	17 45 17.2	2.911	7	6 48 19.16	2.2140	18 21 4.1	1.517
8	5 5 48.24	2.1376	17 48 9.3	2.826	8	6 50 32.03	2.2148	18 19 30.2	1.613
9	5 7 56.56	2.1398	17 50 56.3	2.741	9	6 52 44.94	2.2157	18 17 50.5	1.709
10	5 10 5.02	2.1421	17 53 38.2	2.655	10	6 54 57.91	2.2166	18 16 5.1	1.806
11	5 12 13.61	2.1443	17 56 14.9	2.568	11	6 57 10.93	2.2174	18 14 13.8	1.903
12	5 14 22.33	2.1464	17 58 46.4	2.482	12	6 59 24.00	2.2182	18 12 16.7	2.000
13	5 16 31.18	2.1486	18 1 12.7	2.395	13	7 1 37.11	2.2189	18 10 13.8	2.097
14	5 18 40.16	2.1508	18 3 33.8	2.308	14	7 3 50.27	2.2196	18 8 5.1	2.193
15	5 20 49.27	2.1529	18 5 49.7	2.220	15	7 6 3.46	2.2203	18 5 50.6	2.290
16	5 22 58.51	2.1550	18 8 0.2	2.132	16	7 8 16.70	2.2209	18 3 30.3	2.387
17	5 25 7.87	2.1570	18 10 5.5	2.043	17	7 10 29.97	2.2215	18 1 4.2	2.483
18	5 27 17.35	2.1590	18 12 5.4	1.954	18	7 12 43.28	2.2222	17 58 32.3	2.580
19	5 29 26.95	2.1610	18 14 0.0	1.866	19	7 14 56.63	2.2228	17 55 54.6	2.676
20	5 31 36.67	2.1631	18 15 49.3	1.776	20	7 17 10.02	2.2233	17 53 11.2	2.772
21	5 33 46.52	2.1651	18 17 33.1	1.686	21	7 19 23.43	2.2238	17 50 21.9	2.869
22	5 35 56.48	2.1669	18 19 11.6	1.596	22	7 21 36.87	2.2243	17 47 26.9	2.965
23	5 38 6.55	2.1688	+18 20 44.6	+1.505	23	7 23 50.34	2.2248	+17 44 26.1	-3.062
MAY 18.					MAY 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 40 16.74	2.1707	+18 22 12.2	+1.414	0	7 26 3.84	2.2252	+17 41 19.5	-3.158
1	5 42 27.04	2.1726	18 23 34.3	1.323	1	7 28 17.36	2.2256	17 38 7.2	3.253
2	5 44 37.45	2.1744	18 24 51.0	1.232	2	7 30 30.91	2.2260	17 34 49.1	3.349
3	5 46 47.97	2.1762	18 26 2.1	1.140	3	7 32 44.48	2.2263	17 31 25.3	3.445
4	5 48 58.60	2.1780	18 27 7.8	1.048	4	7 34 58.07	2.2267	17 27 55.7	3.541
5	5 51 9.33	2.1797	18 28 7.9	0.955	5	7 37 11.68	2.2270	17 24 20.4	3.636
6	5 53 20.17	2.1814	18 29 2.4	0.862	6	7 39 25.31	2.2272	17 20 39.4	3.731
7	5 55 31.10	2.1831	18 29 51.4	0.770	7	7 41 38.95	2.2276	17 16 52.7	3.826
8	5 57 42.14	2.1847	18 30 34.8	0.677	8	7 43 52.62	2.2278	17 13 0.3	3.921
9	5 59 53.27	2.1863	18 31 12.6	0.583	9	7 46 6.29	2.2280	17 9 2.2	4.016
10	6 2 4.50	2.1879	18 31 44.8	0.490	10	7 48 19.98	2.2282	17 4 58.4	4.110
11	6 4 15.82	2.1895	18 32 11.4	0.395	11	7 50 33.67	2.2283	17 0 49.0	4.204
12	6 6 27.24	2.1911	18 32 32.2	0.301	12	7 52 47.38	2.2286	16 56 33.9	4.298
13	6 8 38.75	2.1925	18 32 47.5	0.208	13	7 55 1.10	2.2287	16 52 13.2	4.392
14	6 10 50.34	2.1939	18 32 57.1	0.113	14	7 57 14.82	2.2287	16 47 46.8	4.486
15	6 13 2.02	2.1954	18 33 1.0	+0.017	15	7 59 28.55	2.2289	16 43 14.9	4.579
16	6 15 13.79	2.1968	18 32 59.2	-0.078	16	8 1 42.29	2.2290	16 38 37.3	4.673
17	6 17 25.64	2.1982	18 32 51.7	0.172	17	8 3 56.03	2.2290	16 33 54.2	4.765
18	6 19 37.57	2.1994	18 32 38.6	0.267	18	8 6 9.77	2.2291	16 29 5.5	4.857
19	6 21 49.57	2.2007	18 32 19.7	0.362	19	8 8 23.52	2.2291	16 24 11.3	4.950
20	6 24 1.66	2.2021	18 31 55.1	0.458	20	8 10 37.26	2.2291	16 19 11.5	5.042
21	6 26 13.82	2.2033	18 31 24.7	0.554	21	8 12 51.01	2.2292	16 14 6.2	5.133
22	6 28 26.06	2.2045	18 30 48.6	0.649	22	8 15 4.76	2.2292	16 8 55.5	5.225
23	6 30 38.36	2.2057	18 30 6.8	0.745	23	8 17 18.51	2.2291	16 3 39.2	5.317
24	6 32 50.74	2.2069	+18 29 19.2	-0.842	24	8 19 32.25	2.2290	+15 58 17.5	-5.407

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 21.					MAY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 19 32.25	2.2290	+15 58 17.5	-5.407	0	10 6 24.73	2.2259	+10 2 20.7	-9.221
1	8 21 45.99	2.2290	15 52 50.4	5.498	1	10 8 38.29	2.2262	9 53 5.5	9.286
2	8 23 59.73	2.2289	15 47 17.8	5.588	2	10 10 51.87	2.2263	9 43 46.4	9.350
3	8 26 13.46	2.2288	15 41 39.9	5.678	3	10 13 5.45	2.2266	9 34 23.5	9.413
4	8 28 27.19	2.2288	15 35 56.5	5.767	4	10 15 19.06	2.2269	9 24 56.9	9.475
5	8 30 40.92	2.2287	15 30 7.9	5.855	5	10 17 32.68	2.2272	9 15 26.5	9.537
6	8 32 54.64	2.2286	15 24 13.9	5.945	6	10 19 46.32	2.2275	9 5 52.4	9.598
7	8 35 8.35	2.2285	15 18 14.5	6.033	7	10 21 59.98	2.2278	8 56 14.7	9.658
8	8 37 22.06	2.2284	15 12 9.9	6.120	8	10 24 13.66	2.2282	8 46 33.4	9.718
9	8 39 35.76	2.2283	15 6 0.1	6.207	9	10 26 27.36	2.2286	8 36 48.5	9.777
10	8 41 49.45	2.2281	14 59 45.0	6.295	10	10 28 41.09	2.2290	8 27 0.1	9.835
11	8 44 3.13	2.2279	14 53 24.7	6.382	11	10 30 54.84	2.2294	8 17 8.3	9.892
12	8 46 16.80	2.2278	14 46 59.2	6.468	12	10 33 8.62	2.2299	8 7 13.1	9.948
13	8 48 30.47	2.2278	14 40 28.5	6.553	13	10 35 22.43	2.2304	7 57 14.5	10.004
14	8 50 44.13	2.2276	14 33 52.8	6.638	14	10 37 36.27	2.2309	7 47 12.6	10.058
15	8 52 57.78	2.2274	14 27 11.9	6.724	15	10 39 50.14	2.2314	7 37 7.5	10.112
16	8 55 11.42	2.2272	14 20 25.9	6.808	16	10 42 4.04	2.2320	7 26 59.1	10.166
17	8 57 25.05	2.2271	14 13 34.9	6.892	17	10 44 17.98	2.2327	7 16 47.6	10.218
18	8 59 38.67	2.2269	14 6 38.8	6.976	18	10 46 31.97	2.2334	7 6 33.0	10.268
19	9 1 52.28	2.2268	13 59 37.8	7.058	19	10 48 45.99	2.2340	6 56 15.4	10.319
20	9 4 5.89	2.2267	13 52 31.8	7.142	20	10 51 0.05	2.2347	6 45 54.7	10.369
21	9 6 19.48	2.2265	13 45 20.8	7.223	21	10 53 14.15	2.2354	6 35 31.1	10.417
22	9 8 33.07	2.2263	13 38 5.0	7.304	22	10 55 28.30	2.2362	6 25 4.7	10.465
23	9 10 46.64	2.2262	+13 30 44.3	-7.386	23	10 57 42.50	2.2371	+ 6 14 35.3	-10.512
MAY 22.					MAY 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 13 0.21	2.2261	+13 23 18.7	-7.467	0	10 59 56.75	2.2379	+ 6 4 3.2	-10.558
1	9 15 13.77	2.2259	13 15 48.3	7.547	1	11 2 11.05	2.2388	5 53 28.3	10.603
2	9 17 27.32	2.2258	13 8 13.1	7.626	2	11 4 25.40	2.2397	5 42 50.8	10.647
3	9 19 40.87	2.2257	13 0 33.2	7.704	3	11 6 39.81	2.2406	5 32 10.7	10.691
4	9 21 54.41	2.2256	12 52 48.6	7.783	4	11 8 54.27	2.2416	5 21 27.9	10.733
5	9 24 7.94	2.2254	12 44 59.3	7.861	5	11 11 8.80	2.2427	5 10 42.7	10.773
6	9 26 21.46	2.2253	12 37 5.3	7.938	6	11 13 23.39	2.2437	4 59 55.1	10.813
7	9 28 34.98	2.2253	12 29 6.7	8.014	7	11 15 38.04	2.2448	4 49 5.1	10.853
8	9 30 48.50	2.2252	12 21 3.6	8.090	8	11 17 52.76	2.2459	4 38 12.7	10.892
9	9 33 2.01	2.2252	12 12 55.9	8.166	9	11 20 7.55	2.2470	4 27 18.1	10.929
10	9 35 15.52	2.2252	12 4 43.7	8.241	10	11 22 22.40	2.2482	4 16 21.2	10.966
11	9 37 29.03	2.2251	11 56 27.0	8.315	11	11 24 37.33	2.2494	4 5 22.2	11.001
12	9 39 42.53	2.2250	11 48 5.9	8.388	12	11 26 52.33	2.2507	3 54 21.1	11.035
13	9 41 56.03	2.2250	11 39 40.4	8.462	13	11 29 7.41	2.2519	3 43 18.0	11.068
14	9 44 9.53	2.2250	11 31 10.5	8.534	14	11 31 22.56	2.2532	3 32 12.9	11.101
15	9 46 23.03	2.2251	11 22 36.3	8.605	15	11 33 37.80	2.2547	3 21 5.9	11.132
16	9 48 36.54	2.2251	11 13 57.9	8.677	16	11 35 53.12	2.2561	3 9 57.1	11.162
17	9 50 50.04	2.2251	11 5 15.1	8.748	17	11 38 8.53	2.2575	2 58 46.5	11.190
18	9 53 3.55	2.2252	10 56 28.2	8.817	18	11 40 24.02	2.2589	2 47 34.3	11.218
19	9 55 17.06	2.2252	10 47 37.1	8.886	19	11 42 39.60	2.2605	2 36 20.3	11.246
20	9 57 30.58	2.2253	10 38 41.9	8.953	20	11 44 55.28	2.2621	2 25 4.8	11.271
21	9 59 44.10	2.2255	10 29 42.7	9.022	21	11 47 11.05	2.2637	2 13 47.8	11.296
22	10 1 57.64	2.2257	10 20 39.3	9.089	22	11 49 26.92	2.2652	2 2 29.3	11.319
23	10 4 11.18	2.2258	10 11 32.0	9.155	23	11 51 42.88	2.2669	1 51 9.5	11.342
24	10 6 24.73	2.2259	+10 2 20.7	-9.221	24	11 53 58.95	2.2687	+ 1 39 48.3	-11.363

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 25.					MAY 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 53 58.95	2.2687	+1 39 48.3	-11.363	0	13 45 30.76	2.3900	- 7 26 49.7	-10.904
1	11 56 15.12	2.2704	1 28 25.9	-11.383	1	13 47 54.25	2.3931	7 37 42.7	10.862
2	11 58 31.40	2.2722	1 17 2.3	-11.402	2	13 50 17.93	2.3963	7 48 33.1	10.817
3	12 0 47.79	2.2740	1 5 37.6	-11.421	3	13 52 41.81	2.3995	7 59 20.7	10.770
4	12 3 4.28	2.2758	0 54 11.8	-11.438	4	13 55 5.87	2.4025	8 10 5.5	10.722
5	12 5 20.89	2.2777	0 42 45.1	-11.453	5	13 57 30.11	2.4057	8 20 47.4	10.674
6	12 7 37.61	2.2797	0 31 17.5	-11.467	6	13 59 54.55	2.4090	8 31 26.4	10.624
7	12 9 54.45	2.2817	0 19 49.0	-11.481	7	14 2 19.19	2.4122	8 42 2.3	10.572
8	12 12 11.41	2.2837	+0 8 19.8	-11.493	8	14 4 44.01	2.4153	8 52 35.0	10.518
9	12 14 28.49	2.2857	-0 3 10.1	-11.503	9	14 7 9.02	2.4184	9 3 4.5	10.463
10	12 16 45.70	2.2878	0 14 40.6	-11.512	10	14 9 34.22	2.4216	9 13 30.6	10.407
11	12 19 3.03	2.2899	0 26 11.6	-11.521	11	14 11 59.61	2.4248	9 23 53.4	10.350
12	12 21 20.49	2.2921	0 37 43.1	-11.528	12	14 14 25.20	2.4281	9 34 12.6	10.291
13	12 23 38.08	2.2942	0 49 15.0	-11.534	13	14 16 50.98	2.4313	9 44 28.3	10.231
14	12 25 55.80	2.2964	1 0 47.2	-11.539	14	14 19 16.95	2.4344	9 54 40.3	10.168
15	12 28 13.65	2.2987	1 12 19.7	-11.543	15	14 21 43.11	2.4376	10 4 48.5	10.105
16	12 30 31.64	2.3010	1 23 52.3	-11.545	16	14 24 9.46	2.4408	10 14 52.9	10.040
17	12 32 49.77	2.3033	1 35 25.1	-11.546	17	14 26 36.00	2.4439	10 24 53.3	9.973
18	12 35 8.04	2.3057	1 46 57.8	-11.545	18	14 29 2.73	2.4471	10 34 49.7	9.907
19	12 37 26.45	2.3081	1 58 30.5	-11.544	19	14 31 29.65	2.4502	10 44 42.1	9.838
20	12 39 45.01	2.3106	2 10 3.1	-11.542	20	14 33 56.75	2.4533	10 54 30.2	9.767
21	12 42 3.72	2.3130	2 21 35.5	-11.537	21	14 36 24.04	2.4564	11 4 14.1	9.696
22	12 44 22.57	2.3154	2 33 7.5	-11.531	22	14 38 51.52	2.4595	11 13 53.7	9.623
23	12 46 41.57	2.3180	-2 44 39.2	-11.524	23	14 41 19.18	2.4626	-11 23 28.8	-9.548
MAY 26.					MAY 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 49 0.73	2.3206	-2 56 10.4	-11.516	0	14 43 47.03	2.4657	-11 32 59.4	-9.472
1	12 51 20.04	2.3232	3 7 41.1	-11.506	1	14 46 15.06	2.4687	11 42 25.4	9.395
2	12 53 39.51	2.3258	3 19 11.1	-11.495	2	14 48 43.27	2.4717	11 51 46.8	9.316
3	12 55 59.14	2.3285	3 30 40.5	-11.483	3	14 51 11.66	2.4747	12 1 3.3	9.236
4	12 58 18.93	2.3312	3 42 9.1	-11.469	4	14 53 40.23	2.4777	12 10 15.1	9.155
5	13 0 38.88	2.3338	3 53 36.8	-11.453	5	14 56 8.98	2.4806	12 19 21.9	9.072
6	13 2 58.99	2.3366	4 5 3.5	-11.437	6	14 58 37.90	2.4834	12 28 23.7	8.988
7	13 5 19.27	2.3394	4 16 29.3	-11.420	7	15 1 6.99	2.4863	12 37 20.5	8.903
8	13 7 39.72	2.3422	4 27 53.9	-11.401	8	15 3 36.26	2.4892	12 46 12.1	8.816
9	13 10 0.33	2.3450	4 39 17.4	-11.381	9	15 6 5.69	2.4919	12 54 58.4	8.728
10	13 12 21.12	2.3479	4 50 39.6	-11.358	10	15 8 35.29	2.4947	13 3 39.5	8.639
11	13 14 42.08	2.3508	5 2 0.4	-11.335	11	15 11 5.06	2.4975	13 12 15.1	8.548
12	13 17 3.21	2.3536	5 13 19.8	-11.311	12	15 13 34.99	2.5002	13 20 45.3	8.457
13	13 19 24.51	2.3566	5 24 37.7	-11.284	13	15 16 5.08	2.5028	13 29 10.0	8.364
14	13 21 46.00	2.3596	5 35 53.9	-11.257	14	15 18 35.33	2.5055	13 37 29.0	8.270
15	13 24 7.66	2.3624	5 47 8.5	-11.228	15	15 21 5.74	2.5081	13 45 42.4	8.175
16	13 26 29.49	2.3654	5 58 21.3	-11.198	16	15 23 36.30	2.5106	13 53 50.0	8.079
17	13 28 51.51	2.3685	6 9 32.3	-11.167	17	15 26 7.01	2.5131	14 1 51.7	7.980
18	13 31 13.71	2.3715	6 20 41.3	-11.133	18	15 28 37.87	2.5155	14 9 47.6	7.882
19	13 33 36.09	2.3745	6 31 48.3	-11.099	19	15 31 8.87	2.5178	14 17 37.5	7.782
20	13 35 58.65	2.3776	6 42 53.2	-11.062	20	15 33 40.01	2.5202	14 25 21.4	7.681
21	13 38 21.40	2.3807	6 53 55.8	-11.025	21	15 36 11.30	2.5225	14 32 59.2	7.578
22	13 40 44.33	2.3838	7 4 56.2	-10.987	22	15 38 42.71	2.5247	14 40 30.8	7.475
23	13 43 7.45	2.3869	7 15 54.2	-10.946	23	15 41 14.26	2.5269	14 47 56.2	7.371
24	13 45 30.76	2.3900	-7 26 49.7	-10.904	24	15 43 45.94	2.5290	-14 55 15.3	-7.266

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
MAY 29.					MAY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 43 45.94	2.5290	-14 55 15.3	-7.266	0	17 46 10.83	2.5388	-18 27 58.2	-1.421
1	15 46 17.74	2.5311	15 2 28.1	7.159	1	17 48 43.10	2.5368	18 29 19.6	1.293
2	15 48 49.67	2.5331	15 9 34.4	7.052	2	17 51 15.25	2.5347	18 30 33.3	1.165
3	15 51 21.71	2.5350	15 16 34.3	6.943	3	17 53 47.27	2.5325	18 31 39.4	1.038
4	15 53 53.87	2.5368	15 23 27.6	6.833	4	17 56 19.15	2.5302	18 32 37.9	0.912
5	15 56 26.13	2.5386	15 30 14.3	6.723	5	17 58 50.90	2.5280	18 33 28.8	0.784
6	15 58 58.50	2.5403	15 36 54.4	6.612	6	18 1 22.51	2.5256	18 34 12.0	0.657
7	16 1 30.97	2.5420	15 43 27.7	6.500	7	18 3 53.97	2.5230	18 34 47.7	0.532
8	16 4 3.54	2.5436	15 49 54.4	6.387	8	18 6 25.27	2.5204	18 35 15.8	0.406
9	16 6 36.20	2.5451	15 56 14.2	6.273	9	18 8 56.42	2.5177	18 35 36.4	0.281
10	16 9 8.95	2.5466	16 2 27.1	6.158	10	18 11 27.40	2.5149	18 35 49.5	0.155
11	16 11 41.79	2.5480	16 8 33.2	6.042	11	18 13 58.21	2.5121	18 35 55.0	-0.030
12	16 14 14.71	2.5493	16 14 32.2	5.926	12	18 16 28.85	2.5092	18 35 53.1	+0.094
13	16 16 47.70	2.5505	16 20 24.3	5.809	13	18 18 59.31	2.5062	18 35 43.7	0.217
14	16 19 20.77	2.5517	16 26 9.3	5.691	14	18 21 29.59	2.5031	18 35 27.0	0.341
15	16 21 53.90	2.5527	16 31 47.2	5.572	15	18 23 59.68	2.4998	18 35 2.8	0.464
16	16 24 27.09	2.5537	16 37 17.9	5.453	16	18 26 29.57	2.4966	18 34 31.3	0.587
17	16 27 0.35	2.5547	16 42 41.5	5.333	17	18 28 59.27	2.4933	18 33 52.4	0.708
18	16 29 33.65	2.5553	16 47 57.9	5.213	18	18 31 28.77	2.4899	18 33 6.3	0.829
19	16 32 6.99	2.5561	16 53 7.0	5.091	19	18 33 58.06	2.4863	18 32 12.9	0.950
20	16 34 40.38	2.5568	16 58 8.8	4.969	20	18 36 27.13	2.4828	18 31 12.3	1.070
21	16 37 13.81	2.5574	17 3 3.3	4.847	21	18 38 56.00	2.4793	18 30 4.5	1.189
22	16 39 47.27	2.5579	17 7 50.4	4.723	22	18 41 24.64	2.4755	18 28 49.6	1.308
23	16 42 20.76	2.5583	-17 12 30.1	-4.600	23	18 43 53.06	2.4717	-18 27 27.5	+1.427
MAY 30.					JUNE 1.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 44 54.27	2.5586	-17 17 2.4	-4.477	0	18 46 21.25	2.4678	-18 25 58.4	+1.544
1	16 47 27.79	2.5588	17 21 27.3	4.352	1	18 48 49.20	2.4639	18 24 22.2	1.661
2	16 50 1.33	2.5590	17 25 44.6	4.227	2	18 51 16.92	2.4600	18 22 39.1	1.777
3	16 52 34.87	2.5590	17 29 54.5	4.102	3	18 53 44.40	2.4560	18 20 49.0	1.893
4	16 55 8.41	2.5590	17 33 56.8	3.975	4	18 56 11.64	2.4519	18 18 51.9	2.008
5	16 57 41.95	2.5588	17 37 51.5	3.849	5	18 58 38.63	2.4477	18 16 48.0	2.122
6	17 0 15.47	2.5586	17 41 38.7	3.723	6	19 1 5.36	2.4434	18 14 37.3	2.234
7	17 2 48.98	2.5583	17 45 18.3	3.597	7	19 3 31.84	2.4392	18 12 19.9	2.347
8	17 5 22.47	2.5579	17 48 50.3	3.469	8	19 5 58.06	2.4349	18 9 55.7	2.459
9	17 7 55.93	2.5574	17 52 14.6	3.342	9	19 8 24.03	2.4305	18 7 24.8	2.571
10	17 10 29.36	2.5568	17 55 31.3	3.214	10	19 10 49.73	2.4260	18 4 47.2	2.681
11	17 13 2.75	2.5562	17 58 40.3	3.087	11	19 13 15.15	2.4215	18 2 3.1	2.789
12	17 15 36.10	2.5554	18 1 41.7	2.959	12	19 15 40.31	2.4170	17 59 12.5	2.897
13	17 18 9.40	2.5545	18 4 35.4	2.831	13	19 18 5.19	2.4124	17 56 15.4	3.006
14	17 20 42.64	2.5536	18 7 21.4	2.703	14	19 20 29.80	2.4078	17 53 11.8	3.113
15	17 23 15.83	2.5525	18 9 59.7	2.574	15	19 22 54.13	2.4032	17 50 1.9	3.218
16	17 25 48.94	2.5513	18 12 30.3	2.446	16	19 25 18.18	2.3984	17 46 45.6	3.323
17	17 28 21.99	2.5502	18 14 53.2	2.317	17	19 27 41.94	2.3937	17 43 23.1	3.427
18	17 30 54.96	2.5488	18 17 8.4	2.190	18	19 30 5.42	2.3889	17 39 54.3	3.531
19	17 33 27.84	2.5473	18 19 16.0	2.062	19	19 32 28.61	2.3840	17 36 19.4	3.633
20	17 36 0.64	2.5458	18 21 15.8	1.933	20	19 34 51.50	2.3792	17 32 38.3	3.735
21	17 38 33.34	2.5442	18 23 7.9	1.805	21	19 37 14.11	2.3743	17 28 51.2	3.835
22	17 41 5.94	2.5425	18 24 52.4	1.677	22	19 39 36.42	2.3693	17 24 58.1	3.935
23	17 43 38.44	2.5407	18 26 29.1	1.548	23	19 41 58.43	2.3643	17 20 59.0	4.034
24	17 46 10.83	2.5388	-18 27 58.2	-1.421	24	19 44 20.14	2.3593	-17 16 54.0	+4.132

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 2.					JUNE 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 44 20.14	2.3593	-17 16 54.0	+4.132	0	21 31 37.91	2.1140	-12 24 16.7	+7.692
1	19 46 41.55	2.3543	17 12 43.2	4.228	1	21 33 44.61	2.1094	12 16 33.6	7.743
2	19 49 2.66	2.3492	17 8 26.6	4.324	2	21 35 51.04	2.1047	12 8 47.5	7.793
3	19 51 23.46	2.3442	17 4 4.3	4.419	3	21 37 57.18	2.1001	12 0 58.5	7.842
4	19 53 43.96	2.3391	16 59 36.3	4.513	4	21 40 3.05	2.0955	11 53 6.5	7.892
5	19 56 4.15	2.3339	16 55 2.7	4.607	5	21 42 8.64	2.0909	11 45 11.5	7.939
6	19 58 24.03	2.3288	16 50 23.5	4.698	6	21 44 13.96	2.0864	11 37 13.8	7.985
7	20 0 43.61	2.3237	16 45 38.9	4.789	7	21 46 19.01	2.0819	11 29 13.3	8.032
8	20 3 2.87	2.3184	16 40 48.8	4.880	8	21 48 23.79	2.0775	11 21 10.0	8.078
9	20 5 21.82	2.3132	16 35 53.3	4.969	9	21 50 28.31	2.0732	11 13 4.0	8.122
10	20 7 40.46	2.3081	16 30 52.5	5.057	10	21 52 32.57	2.0688	11 4 55.4	8.165
11	20 9 58.79	2.3028	16 25 46.5	5.144	11	21 54 36.56	2.0644	10 56 44.2	8.208
12	20 12 16.80	2.2976	16 20 35.2	5.231	12	21 56 40.30	2.0602	10 48 30.4	8.251
13	20 14 34.50	2.2924	16 15 18.8	5.316	13	21 58 43.78	2.0559	10 40 14.1	8.291
14	20 16 51.89	2.2872	16 9 57.3	5.401	14	22 0 47.01	2.0517	10 31 55.5	8.331
15	20 19 8.96	2.2818	16 4 30.7	5.484	15	22 2 49.98	2.0475	10 23 34.4	8.372
16	20 21 25.71	2.2766	15 58 59.2	5.566	16	22 4 52.71	2.0434	10 15 10.9	8.410
17	20 23 42.15	2.2713	15 53 22.8	5.647	17	22 6 55.19	2.0393	10 6 45.2	8.447
18	20 25 58.27	2.2661	15 47 41.6	5.727	18	22 8 57.43	2.0353	9 58 17.2	8.485
19	20 28 14.08	2.2609	15 41 55.6	5.807	19	22 10 59.43	2.0313	9 49 47.0	8.521
20	20 30 29.58	2.2557	15 36 4.8	5.886	20	22 13 1.19	2.0274	9 41 14.7	8.557
21	20 32 44.76	2.2503	15 30 9.3	5.963	21	22 15 2.72	2.0235	9 32 40.2	8.592
22	20 34 59.62	2.2451	15 24 9.3	6.039	22	22 17 4.01	2.0196	9 24 3.6	8.626
23	20 37 14.17	2.2398	-15 18 4.6	+6.115	23	22 19 5.07	2.0158	- 9 15 25.1	+8.659
JUNE 3.					JUNE 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 39 28.40	2.2346	-15 11 55.5	+6.189	0	22 21 5.91	2.0121	- 9 6 44.5	+8.693
1	20 41 42.32	2.2293	15 5 41.9	6.262	1	22 23 6.52	2.0084	8 58 2.0	8.723
2	20 43 55.92	2.2242	14 59 24.0	6.335	2	22 25 6.92	2.0047	8 49 17.7	8.754
3	20 46 9.22	2.2190	14 53 1.7	6.407	3	22 27 7.09	2.0011	8 40 31.5	8.785
4	20 48 22.20	2.2137	14 46 35.2	6.478	4	22 29 7.05	1.9975	8 31 43.5	8.815
5	20 50 34.87	2.2085	14 40 4.4	6.548	5	22 31 6.79	1.9940	8 22 53.7	8.845
6	20 52 47.22	2.2033	14 33 29.5	6.615	6	22 33 6.33	1.9906	8 14 2.1	8.873
7	20 54 59.27	2.1982	14 26 50.6	6.683	7	22 35 5.66	1.9871	8 5 8.9	8.900
8	20 57 11.01	2.1932	14 20 7.5	6.751	8	22 37 4.78	1.9837	7 56 14.1	8.927
9	20 59 22.45	2.1880	14 13 20.5	6.816	9	22 39 3.71	1.9804	7 47 17.7	8.953
10	21 1 33.57	2.1828	14 6 29.6	6.880	10	22 41 2.43	1.9771	7 38 19.8	8.978
11	21 3 44.39	2.1778	13 59 34.9	6.944	11	22 43 0.96	1.9739	7 29 20.3	9.003
12	21 5 54.91	2.1727	13 52 36.3	7.007	12	22 44 59.30	1.9707	7 20 19.4	9.027
13	21 8 5.12	2.1677	13 45 34.0	7.069	13	22 46 57.45	1.9676	7 11 17.0	9.051
14	21 10 15.03	2.1627	13 38 28.0	7.131	14	22 48 55.41	1.9645	7 2 13.3	9.074
15	21 12 24.65	2.1578	13 31 18.3	7.191	15	22 50 53.19	1.9615	6 53 8.1	9.097
16	21 14 33.96	2.1527	13 24 5.1	7.250	16	22 52 50.79	1.9585	6 44 1.7	9.118
17	21 16 42.97	2.1477	13 16 48.3	7.308	17	22 54 48.21	1.9556	6 34 54.0	9.138
18	21 18 51.69	2.1429	13 9 28.1	7.366	18	22 56 45.46	1.9527	6 25 45.1	9.158
19	21 21 0.12	2.1380	13 2 4.4	7.423	19	22 58 42.54	1.9499	6 16 35.0	9.178
20	21 23 8.25	2.1332	12 54 37.4	7.478	20	23 0 39.45	1.9471	6 7 23.7	9.197
21	21 25 16.10	2.1283	12 47 7.0	7.533	21	23 2 36.19	1.9443	5 58 11.3	9.215
22	21 27 23.66	2.1236	12 39 33.4	7.587	22	23 4 32.77	1.9417	5 48 57.9	9.233
23	21 29 30.93	2.1188	12 31 56.6	7.639	23	23 6 29.20	1.9392	5 39 43.3	9.251
24	21 31 37.91	2.1140	-12 24 16.7	+7.692	24	23 8 25.47	1.9366	- 5 30 27.8	+9.267

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 6.					JUNE 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 8 25.47	1.9366	-5 30 27.8	+9.267	0	0 39 24.37	1.8741	+2 2 17.3	+9.388
1	23 10 21.59	1.9340	5 21 11.3	9.283	1	0 41 16.81	1.8740	2 11 40.3	9.377
2	23 12 17.55	1.9315	5 11 53.9	9.298	2	0 43 9.25	1.8741	2 21 2.6	9.367
3	23 14 13.37	1.9292	5 2 35.6	9.313	3	0 45 1.70	1.8741	2 30 24.3	9.355
4	23 16 9.05	1.9268	4 53 16.4	9.327	4	0 46 54.14	1.8741	2 39 45.2	9.343
5	23 18 4.59	1.9245	4 43 56.4	9.339	5	0 48 46.59	1.8743	2 49 5.5	9.332
6	23 19 59.99	1.9222	4 34 35.7	9.352	6	0 50 39.06	1.8745	2 58 25.0	9.318
7	23 21 55.25	1.9200	4 25 14.1	9.365	7	0 52 31.53	1.8747	3 7 43.7	9.304
8	23 23 50.39	1.9179	4 15 51.9	9.376	8	0 54 24.02	1.8749	3 17 1.5	9.290
9	23 25 45.40	1.9157	4 6 29.0	9.387	9	0 56 16.52	1.8752	3 26 18.5	9.275
10	23 27 40.28	1.9137	3 57 5.4	9.397	10	0 58 9.05	1.8757	3 35 34.5	9.260
11	23 29 35.04	1.9117	3 47 41.3	9.408	11	1 0 1.60	1.8761	3 44 49.7	9.245
12	23 31 29.69	1.9098	3 38 16.5	9.418	12	1 1 54.18	1.8765	3 54 3.9	9.228
13	23 33 24.22	1.9079	3 28 51.2	9.425	13	1 3 46.78	1.8770	4 3 17.1	9.212
14	23 35 18.64	1.9061	3 19 25.5	9.433	14	1 5 39.42	1.8776	4 12 29.3	9.194
15	23 37 12.95	1.9043	3 9 59.2	9.442	15	1 7 32.09	1.8782	4 21 40.4	9.177
16	23 39 7.15	1.9025	3 0 32.5	9.448	16	1 9 24.80	1.8788	4 30 50.5	9.159
17	23 41 1.25	1.9008	2 51 5.4	9.455	17	1 11 17.55	1.8796	4 39 59.5	9.140
18	23 42 55.25	1.8992	2 41 37.9	9.461	18	1 13 10.35	1.8803	4 49 7.3	9.120
19	23 44 49.16	1.8977	2 32 10.1	9.466	19	1 15 3.19	1.8810	4 58 13.9	9.100
20	23 46 42.97	1.8961	2 22 42.0	9.471	20	1 16 56.07	1.8818	5 7 19.3	9.080
21	23 48 36.69	1.8946	2 13 13.6	9.475	21	1 18 49.01	1.8827	5 16 23.5	9.060
22	23 50 30.32	1.8932	2 3 45.0	9.478	22	1 20 42.00	1.8837	5 25 26.5	9.038
23	23 52 23.87	1.8918	-1 54 16.2	+9.482	23	1 22 35.05	1.8846	+5 34 28.1	+9.016
JUNE 7.					JUNE 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 54 17.34	1.8905	-1 44 47.2	+9.484	0	1 24 28.15	1.8855	+5 43 28.4	+8.993
1	23 56 10.73	1.8893	1 35 18.1	9.487	1	1 26 21.31	1.8866	5 52 27.3	8.971
2	23 58 4.05	1.8881	1 25 48.8	9.488	2	1 28 14.54	1.8877	6 1 24.9	8.947
3	23 59 57.30	1.8869	1 16 19.5	9.489	3	1 30 7.84	1.8888	6 10 21.0	8.923
4	0 1 50.48	1.8857	1 6 50.1	9.489	4	1 32 1.20	1.8900	6 19 15.7	8.899
5	0 3 43.59	1.8847	0 57 20.8	9.489	5	1 33 54.64	1.8912	6 28 8.9	8.873
6	0 5 36.64	1.8837	0 47 51.4	9.489	6	1 35 48.15	1.8925	6 37 0.5	8.848
7	0 7 29.63	1.8827	0 38 22.1	9.488	7	1 37 41.74	1.8937	6 45 50.7	8.822
8	0 9 22.56	1.8817	0 28 52.9	9.486	8	1 39 35.40	1.8951	6 54 39.2	8.795
9	0 11 15.44	1.8809	0 19 23.8	9.484	9	1 41 29.15	1.8965	7 3 26.1	8.768
10	0 13 8.27	1.8802	0 9 54.8	9.481	10	1 43 22.98	1.8979	7 12 11.3	8.740
11	0 15 1.06	1.8794	-0 0 26.1	9.478	11	1 45 16.90	1.8993	7 20 54.9	8.712
12	0 16 58.80	1.8787	+0 9 2.5	9.474	12	1 47 10.90	1.9008	7 29 36.8	8.683
13	0 18 46.50	1.8780	0 18 30.8	9.469	13	1 49 5.00	1.9024	7 38 16.9	8.653
14	0 20 39.16	1.8774	0 27 58.8	9.464	14	1 50 59.19	1.9039	7 46 55.2	8.623
15	0 22 31.79	1.8769	0 37 26.5	9.459	15	1 52 53.47	1.9055	7 55 31.7	8.593
16	0 24 24.39	1.8763	0 46 53.9	9.453	16	1 54 47.85	1.9072	8 4 6.4	8.562
17	0 26 16.95	1.8759	0 56 20.9	9.448	17	1 56 42.33	1.9088	8 12 39.2	8.531
18	0 28 9.50	1.8756	1 5 47.6	9.441	18	1 58 36.91	1.9106	8 21 10.1	8.498
19	0 30 2.02	1.8752	1 15 13.8	9.433	19	2 0 31.60	1.9123	8 29 39.0	8.465
20	0 31 54.52	1.8748	1 24 39.5	9.425	20	2 2 26.39	1.9142	8 38 5.9	8.432
21	0 33 47.00	1.8746	1 34 4.8	9.417	21	2 4 21.30	1.9160	8 46 30.9	8.398
22	0 35 39.47	1.8743	1 43 29.5	9.408	22	2 6 16.31	1.9178	8 54 53.7	8.363
23	0 37 31.92	1.8742	1 52 53.7	9.398	23	2 8 11.44	1.9197	9 3 14.5	8.329
24	0 39 24.37	1.8741	+2 2 17.3	+9.388	24	2 10 6.68	1.9217	+9 11 33.2	+8.293

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 10.					JUNE 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 10 6.68	1.9217	+ 9 11 33.2	+8.293	0	3 45 7.76	2.0457	+14 57 32.2	+5.891
1	2 12 2.04	1.9237	9 19 49.7	8.257	1	3 47 10.59	2.0487	15 3 23.7	5.825
2	2 13 57.52	1.9257	9 28 4.1	8.221	2	3 49 13.60	2.0517	15 9 11.2	5.759
3	2 15 53.12	1.9277	9 36 16.2	8.183	3	3 51 16.79	2.0547	15 14 54.8	5.694
4	2 17 48.84	1.9298	9 44 26.1	8.146	4	3 53 20.16	2.0577	15 20 34.5	5.628
5	2 19 44.69	1.9319	9 52 33.7	8.108	5	3 55 23.71	2.0607	15 26 10.1	5.559
6	2 21 40.67	1.9340	10 0 39.0	8.068	6	3 57 27.44	2.0637	15 31 41.6	5.491
7	2 23 36.77	1.9362	10 8 41.9	8.028	7	3 59 31.35	2.0667	15 37 9.0	5.423
8	2 25 33.01	1.9383	10 16 42.4	7.988	8	4 1 35.44	2.0697	15 42 32.3	5.354
9	2 27 29.37	1.9406	10 24 40.5	7.948	9	4 3 39.71	2.0727	15 47 51.5	5.284
10	2 29 25.88	1.9429	10 32 36.2	7.907	10	4 5 44.16	2.0757	15 53 6.4	5.213
11	2 31 22.52	1.9452	10 40 29.3	7.864	11	4 7 48.79	2.0787	15 58 17.0	5.142
12	2 33 19.30	1.9475	10 48 19.9	7.822	12	4 9 53.60	2.0817	16 3 23.4	5.070
13	2 35 16.22	1.9498	10 56 8.0	7.779	13	4 11 58.59	2.0846	16 8 25.4	4.998
14	2 37 13.28	1.9522	11 3 53.4	7.735	14	4 14 3.75	2.0876	16 13 23.1	4.925
15	2 39 10.48	1.9546	11 11 36.2	7.691	15	4 16 9.10	2.0907	16 18 16.4	4.852
16	2 41 7.83	1.9571	11 19 16.3	7.646	16	4 18 14.63	2.0936	16 23 5.3	4.778
17	2 43 5.33	1.9596	11 26 53.7	7.601	17	4 20 20.33	2.0965	16 27 49.7	4.703
18	2 45 2.98	1.9621	11 34 28.4	7.555	18	4 22 26.21	2.0995	16 32 29.7	4.628
19	2 47 0.78	1.9646	11 42 0.3	7.508	19	4 24 32.27	2.1025	16 37 5.1	4.552
20	2 48 58.73	1.9670	11 49 29.4	7.461	20	4 26 38.51	2.1054	16 41 35.9	4.475
21	2 50 56.82	1.9696	11 56 55.6	7.413	21	4 28 44.92	2.1083	16 46 2.1	4.398
22	2 52 55.08	1.9722	12 4 18.9	7.364	22	4 30 51.51	2.1112	16 50 23.7	4.322
23	2 54 53.49	1.9748	+12 11 39.3	+7.316	23	4 32 58.27	2.1142	+16 54 40.7	+4.243
JUNE 11.					JUNE 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 56 52.06	1.9775	+12 18 56.8	+7.267	0	4 35 5.21	2.1171	+16 58 52.9	+4.164
1	2 58 50.79	1.9801	12 26 11.3	7.216	1	4 37 12.32	2.1199	17 3 0.4	4.086
2	3 0 49.67	1.9828	12 33 22.7	7.164	2	4 39 19.60	2.1228	17 7 3.2	4.006
3	3 2 48.72	1.9855	12 40 31.0	7.113	3	4 41 27.05	2.1257	17 11 1.1	3.925
4	3 4 47.93	1.9882	12 47 36.3	7.062	4	4 43 34.68	2.1285	17 14 54.2	3.845
5	3 6 47.30	1.9908	12 54 38.4	7.008	5	4 45 42.47	2.1313	17 18 42.5	3.763
6	3 8 46.83	1.9937	13 1 37.3	6.955	6	4 47 50.43	2.1341	17 22 25.8	3.681
7	3 10 46.54	1.9965	13 8 33.0	6.902	7	4 49 58.56	2.1369	17 26 4.2	3.599
8	3 12 46.41	1.9993	13 15 25.5	6.848	8	4 52 6.86	2.1397	17 29 37.7	3.516
9	3 14 46.45	2.0020	13 22 14.7	6.792	9	4 54 15.32	2.1423	17 33 6.1	3.432
10	3 16 46.65	2.0048	13 29 0.5	6.736	10	4 56 23.94	2.1451	17 36 29.5	3.348
11	3 18 47.03	2.0077	13 35 43.0	6.680	11	4 58 32.73	2.1478	17 39 47.9	3.264
12	3 20 47.58	2.0106	13 42 22.1	6.623	12	5 0 41.68	2.1505	17 43 1.2	3.179
13	3 22 48.30	2.0134	13 48 57.7	6.565	13	5 2 50.79	2.1531	17 46 9.4	3.093
14	3 24 49.19	2.0163	13 55 29.9	6.507	14	5 5 0.05	2.1558	17 49 12.4	3.007
15	3 26 50.26	2.0192	14 1 58.5	6.448	15	5 7 9.48	2.1584	17 52 10.3	2.921
16	3 28 51.50	2.0222	14 8 23.6	6.388	16	5 9 19.06	2.1609	17 55 2.9	2.833
17	3 30 52.92	2.0251	14 14 45.1	6.328	17	5 11 28.79	2.1635	17 57 50.3	2.747
18	3 32 54.51	2.0279	14 21 3.0	6.268	18	5 13 38.68	2.1661	18 0 32.5	2.658
19	3 34 56.27	2.0308	14 27 17.3	6.207	19	5 15 48.72	2.1686	18 3 9.3	2.570
20	3 36 58.21	2.0338	14 33 27.8	6.144	20	5 17 58.91	2.1710	18 5 40.9	2.482
21	3 39 0.33	2.0368	14 39 34.6	6.082	21	5 20 9.24	2.1735	18 8 7.1	2.393
22	3 41 2.63	2.0398	14 45 37.6	6.018	22	5 22 19.73	2.1759	18 10 28.0	2.303
23	3 43 5.11	2.0427	14 51 36.8	5.955	23	5 24 30.35	2.1782	18 12 43.5	2.213
24	3 45 7.76	2.0457	+14 57 32.2	+5.891	24	5 26 41.12	2.1807	+18 14 53.5	+2.122

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 14.					JUNE 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 26 41.12	2.1807	+18 14 53.5	+2.122	0	7 13 22.70	2.2494	+18 6 42.7	-2.532
1	5 28 52.03	2.1830	18 16 58.1	2.032	1	7 15 37.68	2.2409	18 4 7.8	2.632
2	5 31 3.08	2.1852	18 18 57.3	1.941	2	7 17 52.69	2.2503	18 1 26.9	2.731
3	5 33 14.26	2.1875	18 20 51.0	1.848	3	7 20 7.72	2.2506	17 58 40.1	2.829
4	5 35 25.58	2.1898	18 22 39.1	1.756	4	7 22 22.76	2.2509	17 55 47.4	2.927
5	5 37 37.03	2.1920	18 24 21.7	1.663	5	7 24 37.83	2.2512	17 52 48.8	3.027
6	5 39 48.62	2.1942	18 25 58.7	1.571	6	7 26 52.91	2.2515	17 49 44.2	3.126
7	5 42 0.33	2.1963	18 27 30.2	1.478	7	7 29 8.01	2.2517	17 46 33.7	3.223
8	5 44 12.17	2.1983	18 28 56.1	1.384	8	7 31 23.11	2.2518	17 43 17.4	3.322
9	5 46 24.13	2.2003	18 30 16.3	1.290	9	7 33 38.23	2.2520	17 39 55.1	3.420
10	5 48 36.21	2.2024	18 31 30.9	1.196	10	7 35 53.35	2.2520	17 36 27.0	3.517
11	5 50 48.42	2.2044	18 32 39.8	1.102	11	7 38 8.47	2.2521	17 32 53.1	3.615
12	5 53 0.74	2.2063	18 33 43.1	1.007	12	7 40 23.60	2.2522	17 29 13.2	3.713
13	5 55 13.18	2.2082	18 34 40.7	0.912	13	7 42 38.73	2.2522	17 25 27.5	3.810
14	5 57 25.73	2.2101	18 35 32.5	0.816	14	7 44 53.85	2.2521	17 21 36.0	3.907
15	5 59 38.39	2.2120	18 36 18.6	0.720	15	7 47 8.97	2.2519	17 17 38.7	4.003
16	6 1 51.17	2.2138	18 36 58.9	0.624	16	7 49 24.08	2.2518	17 13 35.6	4.100
17	6 4 4.05	2.2155	18 37 33.5	0.528	17	7 51 39.18	2.2517	17 9 26.7	4.196
18	6 6 17.03	2.2172	18 38 2.2	0.431	18	7 53 54.28	2.2515	17 5 12.1	4.292
19	6 8 30.11	2.2189	18 38 25.2	0.335	19	7 56 9.36	2.2513	17 0 51.7	4.387
20	6 10 43.30	2.2206	18 38 42.4	0.238	20	7 58 24.43	2.2510	16 56 25.7	4.482
21	6 12 56.58	2.2221	18 38 53.7	0.140	21	8 0 39.48	2.2507	16 51 53.9	4.577
22	6 15 9.95	2.2237	18 38 59.2	+0.042	22	8 2 54.52	2.2504	16 47 16.4	4.672
23	6 17 23.42	2.2253	+18 38 58.8	-0.055	23	8 5 9.53	2.2501	+16 42 33.2	-4.767
JUNE 15.					JUNE 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 19 36.98	2.2268	+18 38 52.6	-0.153	0	8 7 24.53	2.2498	+16 37 44.4	-4.860
1	6 21 50.63	2.2282	18 38 40.5	0.251	1	8 9 39.50	2.2493	16 32 50.0	4.954
2	6 24 4.36	2.2295	18 38 22.5	0.349	2	8 11 54.45	2.2490	16 27 49.9	5.047
3	6 26 18.17	2.2308	18 37 58.6	0.448	3	8 14 9.38	2.2485	16 22 44.3	5.140
4	6 28 32.06	2.2322	18 37 28.7	0.547	4	8 16 24.27	2.2480	16 17 33.1	5.232
5	6 30 46.03	2.2334	18 36 53.0	0.645	5	8 18 39.14	2.2476	16 12 16.4	5.325
6	6 33 0.07	2.2347	18 36 11.3	0.744	6	8 20 53.98	2.2471	16 6 54.1	5.417
7	6 35 14.19	2.2358	18 35 23.7	0.843	7	8 23 8.79	2.2466	16 1 26.4	5.508
8	6 37 28.37	2.2369	18 34 30.2	0.942	8	8 25 23.57	2.2460	15 55 53.2	5.598
9	6 39 42.62	2.2381	18 33 30.7	1.042	9	8 27 38.31	2.2453	15 50 14.6	5.688
10	6 41 56.94	2.2391	18 32 25.2	1.140	10	8 29 53.01	2.2448	15 44 30.6	5.778
11	6 44 11.31	2.2401	18 31 13.9	1.239	11	8 32 7.68	2.2442	15 38 41.2	5.867
12	6 46 25.75	2.2412	18 29 56.5	1.339	12	8 34 22.31	2.2435	15 32 46.5	5.957
13	6 48 40.25	2.2420	18 28 33.2	1.438	13	8 36 36.90	2.2428	15 26 46.4	6.045
14	6 50 54.79	2.2428	18 27 3.9	1.538	14	8 38 51.45	2.2422	15 20 41.1	6.133
15	6 53 9.39	2.2437	18 25 28.6	1.637	15	8 41 5.96	2.2415	15 14 30.4	6.222
16	6 55 24.04	2.2446	18 23 47.4	1.737	16	8 43 20.43	2.2408	15 8 14.5	6.308
17	6 57 38.74	2.2453	18 22 0.2	1.837	17	8 45 34.86	2.2401	15 1 53.5	6.394
18	6 59 53.47	2.2459	18 20 7.0	1.936	18	8 47 49.24	2.2393	14 55 27.2	6.481
19	7 2 8.25	2.2467	18 18 7.9	2.035	19	8 50 3.58	2.2387	14 48 55.8	6.566
20	7 4 23.07	2.2473	18 16 2.8	2.135	20	8 52 17.88	2.2379	14 42 19.3	6.651
21	7 6 37.93	2.2479	18 13 51.7	2.234	21	8 54 32.13	2.2371	14 35 37.7	6.735
22	7 8 52.82	2.2485	18 11 34.7	2.333	22	8 56 46.33	2.2363	14 28 51.1	6.819
23	7 11 7.75	2.2490	18 9 11.7	2.433	23	8 59 0.48	2.2355	14 21 59.4	6.902
24	7 13 22.70	2.2494	+18 6 42.7	-2.532	24	9 1 14.59	2.2348	+14 15 2.8	-6.985

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 18.					JUNE 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 1 14.59	2.2348	+14 15 2.8	-6.985	0	10 47 39.30	2.2042	+7 17 7.4	-10.142
1	9 3 28.65	2.2339	14 8 1.2	7.067	1	10 49 51.55	2.2041	7 6 57.5	10.188
2	9 5 42.66	2.2332	14 0 54.7	7.148	2	10 52 3.79	2.2039	6 56 44.9	10.233
3	9 7 56.63	2.2323	13 53 43.4	7.230	3	10 54 16.02	2.2038	6 46 29.5	10.278
4	9 10 10.54	2.2315	13 46 27.1	7.311	4	10 56 28.25	2.2037	6 36 11.5	10.321
5	9 12 24.41	2.2307	13 39 6.1	7.389	5	10 58 40.47	2.2037	6 25 51.0	10.364
6	9 14 38.22	2.2298	13 31 40.4	7.468	6	11 0 52.69	2.2037	6 15 27.8	10.407
7	9 16 51.99	2.2291	13 24 9.9	7.547	7	11 3 4.92	2.2038	6 5 2.2	10.447
8	9 19 5.71	2.2282	13 16 34.7	7.626	8	11 5 17.15	2.2038	5 54 34.2	10.487
9	9 21 19.37	2.2273	13 8 54.8	7.703	9	11 7 29.38	2.2040	5 44 3.8	10.526
10	9 23 32.99	2.2266	13 1 10.4	7.778	10	11 9 41.63	2.2042	5 33 31.1	10.563
11	9 25 46.56	2.2257	12 53 21.4	7.855	11	11 11 53.88	2.2043	5 22 56.2	10.601
12	9 28 0.08	2.2249	12 45 27.8	7.930	12	11 14 6.14	2.2045	5 12 19.0	10.637
13	9 30 13.55	2.2241	12 37 29.8	8.004	13	11 16 18.42	2.2047	5 1 39.7	10.673
14	9 32 26.97	2.2233	12 29 27.3	8.078	14	11 18 30.71	2.2050	4 50 58.3	10.708
15	9 34 40.35	2.2225	12 21 20.4	8.152	15	11 20 43.02	2.2054	4 40 14.8	10.741
16	9 36 53.67	2.2217	12 13 9.1	8.224	16	11 22 55.36	2.2058	4 29 29.4	10.773
17	9 39 6.95	2.2209	12 4 53.5	8.296	17	11 25 7.72	2.2062	4 18 42.0	10.805
18	9 41 20.18	2.2201	11 56 33.6	8.368	18	11 27 20.10	2.2066	4 7 52.8	10.835
19	9 43 33.36	2.2193	11 48 9.4	8.438	19	11 29 32.51	2.2071	3 57 1.8	10.864
20	9 45 46.50	2.2186	11 39 41.1	8.507	20	11 31 44.95	2.2077	3 46 9.1	10.893
21	9 47 59.59	2.2178	11 31 8.6	8.576	21	11 33 57.43	2.2082	3 35 14.7	10.921
22	9 50 12.64	2.2171	11 22 32.0	8.644	22	11 36 9.93	2.2088	3 24 18.6	10.948
23	9 52 25.64	2.2163	+11 13 51.3	-8.712	23	11 38 22.48	2.2095	+3 13 20.9	-10.973
JUNE 19.					JUNE 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 54 38.60	2.2157	+11 5 6.6	-8.778	0	11 40 35.07	2.2102	+3 2 21.8	-10.998
1	9 56 51.52	2.2149	10 56 17.9	8.844	1	11 42 47.70	2.2108	2 51 21.2	11.022
2	9 59 4.39	2.2142	10 47 25.3	8.910	2	11 45 0.37	2.2116	2 40 19.2	11.044
3	10 1 17.23	2.2136	10 38 28.7	8.974	3	11 47 13.09	2.2124	2 29 15.9	11.065
4	10 3 30.02	2.2128	10 29 28.4	9.038	4	11 49 25.86	2.2133	2 18 11.4	11.086
5	10 5 42.77	2.2122	10 20 24.2	9.101	5	11 51 38.69	2.2142	2 7 5.6	11.106
6	10 7 55.49	2.2117	10 11 16.3	9.163	6	11 53 51.56	2.2151	1 55 58.7	11.124
7	10 10 8.17	2.2110	10 2 4.7	9.224	7	11 56 4.50	2.2161	1 44 50.7	11.142
8	10 12 20.81	2.2104	9 52 49.4	9.285	8	11 58 17.49	2.2171	1 33 41.7	11.158
9	10 14 33.42	2.2098	9 43 30.5	9.345	9	12 0 30.55	2.2182	1 22 31.7	11.173
10	10 16 45.99	2.2093	9 34 8.0	9.403	10	12 2 43.67	2.2193	1 11 20.9	11.187
11	10 18 58.54	2.2088	9 24 42.1	9.462	11	12 4 56.86	2.2204	1 0 9.2	11.202
12	10 21 11.05	2.2083	9 15 12.6	9.519	12	12 7 10.12	2.2216	0 48 56.7	11.214
13	10 23 23.53	2.2078	9 5 39.8	9.575	13	12 9 23.45	2.2228	0 37 43.5	11.225
14	10 25 35.99	2.2073	8 56 3.6	9.631	14	12 11 36.86	2.2241	0 26 29.7	11.235
15	10 27 48.41	2.2068	8 46 24.1	9.686	15	12 13 50.34	2.2254	0 15 15.3	11.244
16	10 30 0.81	2.2065	8 36 41.3	9.740	16	12 16 3.91	2.2267	+0 4 0.4	11.252
17	10 32 13.19	2.2062	8 26 55.3	9.793	17	12 18 17.55	2.2281	-0 7 14.9	11.259
18	10 34 25.55	2.2057	8 17 6.1	9.846	18	12 20 31.28	2.2296	0 18 30.7	11.265
19	10 36 37.88	2.2053	8 7 13.8	9.898	19	12 22 45.10	2.2311	0 29 46.7	11.269
20	10 38 50.19	2.2051	7 57 18.4	9.948	20	12 24 59.01	2.2327	0 41 3.0	11.273
21	10 41 2.49	2.2048	7 47 20.1	9.998	21	12 27 13.02	2.2343	0 52 19.5	11.276
22	10 43 14.77	2.2046	7 37 18.7	10.047	22	12 29 27.12	2.2358	1 3 36.1	11.278
23	10 45 27.04	2.2044	7 27 14.5	10.094	23	12 31 41.31	2.2374	1 14 52.8	11.278
24	10 47 39.30	2.2042	+7 17 7.4	-10.142	24	12 33 55.61	2.2392	-1 26 9.4	-11.277

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 22.					JUNE 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 33 55.61	2.2392	- 1 26 9.4	-11.277	0	14 24 5.14	2.3627	-10 4 16.5	-9.844
1	12 36 10.01	2.2409	1 37 26.0	11.275	1	14 26 26.99	2.3658	10 14 5.4	9.784
2	12 38 24.52	2.2427	1 48 42.4	11.272	2	14 28 49.04	2.3691	10 23 50.6	9.722
3	12 40 39.13	2.2445	1 59 58.6	11.268	3	14 31 11.28	2.3723	10 33 32.1	9.659
4	12 42 53.86	2.2464	2 11 14.5	11.263	4	14 33 33.71	2.3754	10 43 9.7	9.596
5	12 45 8.70	2.2483	2 22 30.1	11.256	5	14 35 56.33	2.3786	10 52 43.6	9.532
6	12 47 23.66	2.2502	2 33 45.2	11.248	6	14 38 19.14	2.3818	11 2 13.5	9.464
7	12 49 38.73	2.2522	2 44 59.9	11.240	7	14 40 42.15	2.3850	11 11 39.3	9.397
8	12 51 53.92	2.2542	2 56 14.0	11.230	8	14 43 5.34	2.3882	11 21 1.1	9.328
9	12 54 9.24	2.2563	3 7 27.5	11.219	9	14 45 28.73	2.3914	11 30 18.7	9.258
10	12 56 24.68	2.2584	3 18 40.3	11.207	10	14 47 52.31	2.3946	11 39 32.1	9.187
11	12 58 40.25	2.2606	3 29 52.3	11.193	11	14 50 16.08	2.3978	11 48 41.1	9.114
12	13 0 55.95	2.2628	3 41 3.5	11.179	12	14 52 40.04	2.4009	11 57 45.8	9.041
13	13 3 11.78	2.2650	3 52 13.8	11.163	13	14 55 4.19	2.4041	12 6 46.0	8.966
14	13 5 27.75	2.2672	4 3 23.1	11.146	14	14 57 28.53	2.4073	12 15 41.7	8.890
15	13 7 43.85	2.2696	4 14 31.3	11.128	15	14 59 53.07	2.4105	12 24 32.8	8.813
16	13 10 0.10	2.2720	4 25 38.5	11.109	16	15 2 17.79	2.4136	12 33 19.2	8.734
17	13 12 16.49	2.2743	4 36 44.4	11.088	17	15 4 42.70	2.4167	12 42 0.9	8.654
18	13 14 33.01	2.2767	4 47 49.1	11.067	18	15 7 7.79	2.4198	12 50 37.7	8.573
19	13 16 49.69	2.2792	4 58 52.4	11.043	19	15 9 33.08	2.4230	12 59 9.6	8.491
20	13 19 6.51	2.2817	5 9 54.3	11.019	20	15 11 58.55	2.4260	13 7 36.6	8.408
21	13 21 23.49	2.2842	5 20 54.7	10.994	21	15 14 24.20	2.4291	13 15 58.6	8.324
22	13 23 40.61	2.2867	5 31 53.6	10.968	22	15 16 50.04	2.4322	13 24 15.5	8.238
23	13 25 57.89	2.2893	- 5 42 50.9	-10.940	23	15 19 16.06	2.4352	-13 32 27.1	-8.151
JUNE 23.					JUNE 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 28 15.33	2.2920	- 5 53 46.4	-10.911	0	15 21 42.26	2.4382	-13 40 33.6	-8.063
1	13 30 32.93	2.2946	6 4 40.2	10.881	1	15 24 8.64	2.4412	13 48 34.7	7.974
2	13 32 50.68	2.2973	6 15 32.1	10.849	2	15 26 35.20	2.4441	13 56 30.5	7.885
3	13 35 8.60	2.3001	6 26 22.1	10.817	3	15 29 1.93	2.4470	14 4 20.9	7.793
4	13 37 26.69	2.3028	6 37 10.1	10.783	4	15 31 28.84	2.4499	14 12 5.7	7.701
5	13 39 44.93	2.3055	6 47 56.0	10.748	5	15 33 55.92	2.4528	14 19 45.0	7.608
6	13 42 3.35	2.3084	6 58 39.8	10.712	6	15 36 23.17	2.4556	14 27 18.6	7.513
7	13 44 21.94	2.3112	7 9 21.4	10.674	7	15 38 50.59	2.4583	14 34 46.5	7.417
8	13 46 40.69	2.3140	7 20 0.7	10.635	8	15 41 18.17	2.4611	14 42 8.7	7.322
9	13 48 59.62	2.3169	7 30 37.6	10.595	9	15 43 45.92	2.4638	14 49 25.1	7.224
10	13 51 18.72	2.3198	7 41 12.1	10.553	10	15 46 13.83	2.4665	14 56 35.6	7.125
11	13 53 38.00	2.3228	7 51 44.0	10.511	11	15 48 41.90	2.4692	15 3 40.1	7.025
12	13 55 57.46	2.3257	8 2 13.4	10.468	12	15 51 10.13	2.4718	15 10 38.6	6.925
13	13 58 17.09	2.3287	8 12 40.1	10.423	13	15 53 38.51	2.4743	15 17 31.1	6.823
14	14 0 36.90	2.3317	8 23 4.1	10.377	14	15 56 7.04	2.4768	15 24 17.4	6.721
15	14 2 56.89	2.3348	8 33 25.3	10.328	15	15 58 35.72	2.4793	15 30 57.6	6.618
16	14 5 17.07	2.3378	8 43 43.5	10.277	16	16 1 4.55	2.4817	15 37 31.5	6.513
17	14 7 37.43	2.3408	8 53 58.8	10.230	17	16 3 33.52	2.4839	15 43 59.1	6.408
18	14 9 57.97	2.3438	9 4 11.1	10.178	18	16 6 2.62	2.4862	15 50 20.4	6.302
19	14 12 18.69	2.3470	9 14 20.2	10.125	19	16 8 31.86	2.4885	15 56 35.3	6.194
20	14 14 39.61	2.3502	9 24 26.1	10.072	20	16 11 1.24	2.4907	16 2 43.7	6.086
21	14 17 0.71	2.3533	9 34 28.8	10.017	21	16 13 30.74	2.4928	16 8 45.6	5.977
22	14 19 22.00	2.3563	9 44 28.2	9.961	22	16 16 0.37	2.4948	16 14 41.0	5.868
23	14 21 43.47	2.3595	9 54 24.1	9.903	23	16 18 30.12	2.4968	16 20 29.8	5.758
24	14 24 5.14	2.3627	-10 4 16.5	-9.844	24	16 20 59.99	2.4987	-16 26 11.9	-5.646

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 26.					JUNE 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 20 59.99	2.4987	-16 26 11.9	-5.646	0	18 21 44.14	2.4992	-18 38 55.0	+0.210
1	16 23 29.97	2.5007	16 31 47.3	5.534	1	18 24 14.03	2.4970	18 38 38.7	0.333
2	16 26 0.07	2.5025	16 37 16.0	5.421	2	18 26 43.78	2.4947	18 38 15.0	0.456
3	16 28 30.27	2.5042	16 42 37.8	5.308	3	18 29 13.40	2.4925	18 37 44.0	0.578
4	16 31 0.57	2.5059	16 47 52.9	5.193	4	18 31 42.88	2.4901	18 37 5.6	0.701
5	16 33 30.98	2.5076	16 53 1.0	5.078	5	18 34 12.21	2.4876	18 36 19.9	0.822
6	16 36 1.48	2.5091	16 58 2.2	4.963	6	18 36 41.39	2.4851	18 35 26.9	0.943
7	16 38 32.07	2.5106	17 2 56.5	4.847	7	18 39 10.42	2.4825	18 34 26.7	1.063
8	16 41 2.75	2.5119	17 7 43.8	4.730	8	18 41 39.29	2.4798	18 33 19.3	1.183
9	16 43 33.50	2.5133	17 12 24.1	4.612	9	18 44 7.99	2.4760	18 32 4.7	1.303
10	16 46 4.34	2.5145	17 16 57.2	4.493	10	18 46 36.52	2.4740	18 30 42.9	1.422
11	16 48 35.24	2.5157	17 21 23.3	4.375	11	18 49 4.87	2.4711	18 29 14.0	1.542
12	16 51 6.22	2.5168	17 25 42.2	4.255	12	18 51 33.05	2.4681	18 27 37.9	1.660
13	16 53 37.26	2.5178	17 29 53.9	4.136	13	18 54 1.04	2.4650	18 25 54.8	1.777
14	16 56 8.36	2.5187	17 33 58.5	4.016	14	18 56 28.85	2.4618	18 24 4.6	1.894
15	16 58 39.51	2.5196	17 37 55.8	3.894	15	18 58 56.46	2.4585	18 22 7.5	2.010
16	17 1 10.71	2.5204	17 41 45.8	3.772	16	19 1 23.87	2.4552	18 20 3.4	2.127
17	17 3 41.96	2.5212	17 45 28.5	3.651	17	19 3 51.09	2.4518	18 17 52.3	2.242
18	17 6 13.25	2.5218	17 49 3.9	3.529	18	19 6 18.09	2.4483	18 15 34.4	2.355
19	17 8 44.57	2.5223	17 52 32.0	3.407	19	19 8 44.89	2.4449	18 13 9.7	2.469
20	17 11 15.92	2.5227	17 55 52.7	3.283	20	19 11 11.48	2.4413	18 10 38.1	2.582
21	17 13 47.29	2.5230	17 59 6.0	3.161	21	19 13 37.85	2.4376	18 7 59.8	2.694
22	17 16 18.68	2.5233	18 2 12.0	3.037	22	19 16 3.99	2.4338	18 5 14.8	2.806
23	17 18 50.09	2.5236	-18 5 10.5	-2.913	23	19 18 29.91	2.4301	-18 2 23.1	+2.917
JUNE 27.					JUNE 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 21 21.51	2.5237	-18 8 1.5	-2.788	0	19 20 55.60	2.4263	-17 59 24.7	+3.028
1	17 23 52.93	2.5237	18 10 45.1	2.664	1	19 23 21.06	2.4223	17 56 19.8	3.137
2	17 26 24.35	2.5236	18 13 21.2	2.540	2	19 25 46.28	2.4183	17 53 8.3	3.245
3	17 28 55.76	2.5234	18 15 49.9	2.415	3	19 28 11.26	2.4143	17 49 50.4	3.352
4	17 31 27.16	2.5232	18 18 11.0	2.289	4	19 30 36.00	2.4103	17 46 26.0	3.459
5	17 33 58.54	2.5228	18 20 24.6	2.164	5	19 33 0.50	2.4062	17 42 55.3	3.565
6	17 36 29.89	2.5223	18 22 30.7	2.039	6	19 35 24.74	2.4019	17 39 18.2	3.671
7	17 39 1.22	2.5219	18 24 29.3	1.914	7	19 37 48.73	2.3977	17 35 34.8	3.775
8	17 41 32.52	2.5213	18 26 20.4	1.788	8	19 40 12.47	2.3935	17 31 45.2	3.878
9	17 44 3.77	2.5205	18 28 3.9	1.662	9	19 42 35.95	2.3892	17 27 49.4	3.981
10	17 46 34.98	2.5197	18 29 39.9	1.537	10	19 44 59.17	2.3848	17 23 47.5	4.083
11	17 49 6.14	2.5188	18 31 8.4	1.412	11	19 47 22.13	2.3804	17 19 39.5	4.184
12	17 51 37.24	2.5178	18 32 29.3	1.286	12	19 49 44.82	2.3759	17 15 25.4	4.284
13	17 54 8.28	2.5168	18 33 42.7	1.161	13	19 52 7.24	2.3715	17 11 5.4	4.383
14	17 56 39.26	2.5157	18 34 48.6	1.035	14	19 54 29.40	2.3669	17 6 39.5	4.481
15	17 59 10.16	2.5143	18 35 46.9	0.909	15	19 56 51.27	2.3622	17 2 7.7	4.578
16	18 1 40.98	2.5131	18 36 37.7	0.784	16	19 59 12.87	2.3577	16 57 30.1	4.675
17	18 4 11.73	2.5117	18 37 21.0	0.659	17	20 1 34.20	2.3531	16 52 46.7	4.770
18	18 6 42.38	2.5101	18 37 56.8	0.535	18	20 3 55.24	2.3484	16 47 57.7	4.864
19	18 9 12.94	2.5085	18 38 25.2	0.410	19	20 6 16.01	2.3437	16 43 3.0	4.958
20	18 11 43.40	2.5068	18 38 46.0	0.285	20	20 8 36.49	2.3389	16 38 2.7	5.050
21	18 14 13.75	2.5050	18 38 59.4	0.162	21	20 10 56.68	2.3342	16 32 57.0	5.142
22	18 16 44.00	2.5032	18 39 5.4	-0.037	22	20 13 16.59	2.3294	16 27 45.7	5.233
23	18 19 14.13	2.5012	18 39 3.9	+0.087	23	20 15 36.21	2.3246	16 22 29.1	5.322
24	18 21 44.14	2.4992	-18 38 55.0	+0.210	24	20 17 55.54	2.3198	-16 17 7.1	+5.411

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JUNE 30.					JULY 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 17 55.54	2.3198	-16 17 7.1	+5.411	0	22 3 36.71	2.0882	-10 34 20.1	+8.494
1	20 20 14.58	2.3149	16 11 39.8	5.498	1	22 5 41.87	2.0838	10 25 49.2	8.535
2	20 22 33.33	2.3100	16 6 7.3	5.584	2	22 7 46.76	2.0794	10 17 15.9	8.576
3	20 24 51.78	2.3051	16 0 29.7	5.670	3	22 9 51.40	2.0752	10 8 40.1	8.615
4	20 27 9.94	2.3002	15 54 46.9	5.756	4	22 11 55.79	2.0710	10 0 2.1	8.653
5	20 29 27.80	2.2953	15 48 59.0	5.839	5	22 13 59.92	2.0668	9 51 21.8	8.690
6	20 31 45.37	2.2904	15 43 6.2	5.922	6	22 16 3.80	2.0627	9 42 39.3	8.726
7	20 34 2.65	2.2854	15 37 8.4	6.003	7	22 18 7.44	2.0586	9 33 54.7	8.762
8	20 36 19.62	2.2804	15 31 5.8	6.083	8	22 20 10.83	2.0544	9 25 7.9	8.798
9	20 38 36.30	2.2754	15 24 58.4	6.163	9	22 22 13.97	2.0504	9 16 19.0	8.832
10	20 40 52.67	2.2704	15 18 46.2	6.242	10	22 24 16.88	2.0465	9 7 28.1	8.865
11	20 43 8.75	2.2655	15 12 29.4	6.319	11	22 26 19.55	2.0425	8 58 35.2	8.898
12	20 45 24.53	2.2605	15 6 7.9	6.396	12	22 28 21.98	2.0386	8 49 40.4	8.929
13	20 47 40.01	2.2555	14 59 41.9	6.472	13	22 30 24.18	2.0347	8 40 43.7	8.959
14	20 49 55.19	2.2505	14 53 11.3	6.546	14	22 32 26.14	2.0308	8 31 45.3	8.989
15	20 52 10.07	2.2455	14 46 36.4	6.619	15	22 34 27.88	2.0272	8 22 45.0	9.019
16	20 54 24.65	2.2405	14 39 57.0	6.692	16	22 36 29.40	2.0234	8 13 43.0	9.048
17	20 56 38.93	2.2355	14 33 13.3	6.763	17	22 38 30.69	2.0197	8 4 39.3	9.075
18	20 58 52.91	2.2305	14 26 25.4	6.834	18	22 40 31.76	2.0161	7 55 34.0	9.102
19	21 1 6.59	2.2255	14 19 33.2	6.901	19	22 42 32.62	2.0125	7 46 27.1	9.128
20	21 3 19.97	2.2205	14 12 36.9	6.972	20	22 44 33.26	2.0088	7 37 18.7	9.153
21	21 5 33.05	2.2156	14 5 36.6	7.039	21	22 46 33.68	2.0053	7 28 8.8	9.178
22	21 7 45.84	2.2106	13 58 32.2	7.107	22	22 48 33.90	2.0019	7 18 57.4	9.202
23	21 9 58.32	2.2056	-13 51 23.8	+7.172	23	22 50 33.91	1.9985	- 7 9 44.6	+9.225
JULY 1.					JULY 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 12 10.51	2.2007	-13 44 11.6	+7.236	0	22 52 33.72	1.9952	- 7 0 30.4	+9.247
1	21 14 22.40	2.1958	13 36 55.5	7.299	1	22 54 33.33	1.9918	6 51 14.9	9.268
2	21 16 34.00	2.1908	13 29 35.7	7.362	2	22 56 32.74	1.9885	6 41 58.2	9.289
3	21 18 45.30	2.1859	13 22 12.1	7.423	3	22 58 31.95	1.9853	6 32 40.2	9.309
4	21 20 56.31	2.1810	13 14 44.9	7.484	4	23 0 30.98	1.9822	6 23 21.1	9.328
5	21 23 7.02	2.1762	13 7 14.0	7.543	5	23 2 29.81	1.9790	6 14 0.8	9.347
6	21 25 17.45	2.1713	12 59 39.7	7.602	6	23 4 28.46	1.9759	6 4 39.4	9.365
7	21 27 27.58	2.1664	12 52 1.8	7.660	7	23 6 26.92	1.9728	5 55 17.0	9.382
8	21 29 37.42	2.1616	12 44 20.5	7.717	8	23 8 25.20	1.9699	5 45 53.5	9.399
9	21 31 46.97	2.1568	12 36 35.8	7.772	9	23 10 23.31	1.9669	5 36 29.1	9.415
10	21 33 56.24	2.1521	12 28 47.9	7.827	10	23 12 21.23	1.9640	5 27 3.7	9.431
11	21 36 5.22	2.1473	12 20 56.6	7.881	11	23 14 18.99	1.9613	5 17 37.4	9.445
12	21 38 13.92	2.1426	12 13 2.2	7.933	12	23 16 16.58	1.9584	5 8 10.3	9.459
13	21 40 22.33	2.1379	12 5 4.6	7.985	13	23 18 14.00	1.9557	4 58 42.3	9.472
14	21 42 30.47	2.1333	11 57 4.0	8.036	14	23 20 11.26	1.9530	4 49 13.6	9.484
15	21 44 38.32	2.1286	11 49 0.3	8.087	15	23 22 8.36	1.9504	4 39 44.2	9.496
16	21 46 45.90	2.1240	11 40 53.6	8.135	16	23 24 5.31	1.9478	4 30 14.1	9.508
17	21 48 53.20	2.1193	11 32 44.1	8.183	17	23 26 2.09	1.9452	4 20 43.3	9.519
18	21 51 0.22	2.1148	11 24 31.6	8.231	18	23 27 58.73	1.9428	4 11 11.8	9.529
19	21 53 6.97	2.1103	11 16 16.4	8.277	19	23 29 55.22	1.9403	4 1 39.8	9.538
20	21 55 13.46	2.1058	11 7 58.4	8.323	20	23 31 51.57	1.9379	3 52 7.3	9.546
21	21 57 19.67	2.1013	10 59 37.7	8.367	21	23 33 47.77	1.9356	3 42 34.3	9.554
22	21 59 25.61	2.0968	10 51 14.4	8.410	22	23 35 43.84	1.9333	3 33 0.8	9.562
23	22 1 31.29	2.0925	10 42 48.5	8.453	23	23 37 39.77	1.9311	3 23 26.8	9.569
24	22 3 36.71	2.0882	-10 34 20.1	+8.494	24	23 39 35.57	1.9289	- 3 13 52.5	+9.575

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 4.					JULY 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 39 35.57	1.9289	-3 13 52.5	+9.575	0	1 10 39.52	1.8852	+ 4 22 6.1	+9.218
1	23 41 31.24	1.9268	3 4 17.8	9.581	1	1 12 32.64	1.8856	4 31 18.6	9.198
2	23 43 26.78	1.9248	2 54 42.8	9.585	2	1 14 25.79	1.8860	4 40 29.9	9.178
3	23 45 22.21	1.9228	2 45 7.6	9.589	3	1 16 18.96	1.8864	4 49 40.0	9.157
4	23 47 17.51	1.9208	2 35 32.1	9.594	4	1 18 12.16	1.8868	4 58 48.7	9.135
5	23 49 12.70	1.9188	2 25 56.3	9.597	5	1 20 5.38	1.8873	5 7 56.2	9.113
6	23 51 7.77	1.9169	2 16 20.4	9.599	6	1 21 58.64	1.8880	5 17 2.3	9.090
7	23 53 2.73	1.9151	2 6 44.4	9.602	7	1 23 51.94	1.8886	5 26 7.0	9.067
8	23 54 57.58	1.9133	1 57 8.2	9.603	8	1 25 45.27	1.8893	5 35 10.3	9.043
9	23 56 52.33	1.9117	1 47 32.0	9.604	9	1 27 38.65	1.8900	5 44 12.1	9.019
10	23 58 46.98	1.9100	1 37 55.7	9.605	10	1 29 32.07	1.8907	5 53 12.6	8.995
11	0 0 41.53	1.9084	1 28 19.4	9.604	11	1 31 25.53	1.8915	6 2 11.5	8.969
12	0 2 35.99	1.9068	1 18 43.2	9.603	12	1 33 19.05	1.8924	6 11 8.9	8.943
13	0 4 30.35	1.9053	1 9 7.0	9.602	13	1 35 12.62	1.8933	6 20 4.7	8.917
14	0 6 24.63	1.9039	0 59 30.9	9.600	14	1 37 6.25	1.8943	6 28 59.0	8.892
15	0 8 18.82	1.9025	0 49 55.0	9.597	15	1 38 59.93	1.8953	6 37 51.7	8.864
16	0 10 12.93	1.9012	0 40 19.3	9.594	16	1 40 53.68	1.8963	6 46 42.7	8.836
17	0 12 6.96	1.8998	0 30 43.7	9.592	17	1 42 47.49	1.8974	6 55 32.0	8.808
18	0 14 0.91	1.8986	0 21 8.3	9.587	18	1 44 41.37	1.8985	7 4 19.6	8.779
19	0 15 54.79	1.8974	0 11 33.3	9.582	19	1 46 35.31	1.8997	7 13 5.5	8.750
20	0 17 48.60	1.8963	-0 1 58.5	9.577	20	1 48 29.33	1.9009	7 21 49.6	8.720
21	0 19 42.35	1.8952	+0 7 35.9	9.571	21	1 50 23.42	1.9022	7 30 31.9	8.690
22	0 21 36.03	1.8942	0 17 10.0	9.565	22	1 52 17.59	1.9035	7 39 12.4	8.659
23	0 23 29.65	1.8932	0 26 43.7	+9.558	23	1 54 11.84	1.9048	+ 7 47 51.0	+8.628
JULY 5.					JULY 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 25 23.21	1.8923	+0 36 17.0	+9.551	0	1 56 6.17	1.9063	+ 7 56 27.7	+8.536
1	0 27 16.72	1.8914	0 45 49.8	9.543	1	1 58 0.59	1.9077	8 5 2.5	8.563
2	0 29 10.18	1.8906	0 55 22.1	9.534	2	1 59 55.09	1.9091	8 13 35.3	8.530
3	0 31 3.59	1.8898	1 4 53.9	9.525	3	2 1 49.68	1.9106	8 22 6.1	8.498
4	0 32 56.95	1.8890	1 14 25.1	9.515	4	2 3 44.36	1.9122	8 30 35.0	8.464
5	0 34 50.27	1.8884	1 23 55.7	9.506	5	2 5 39.14	1.9138	8 39 1.8	8.429
6	0 36 43.56	1.8878	1 33 25.8	9.496	6	2 7 34.02	1.9155	8 47 26.5	8.394
7	0 38 36.81	1.8872	1 42 55.2	9.484	7	2 9 29.00	1.9172	8 55 49.1	8.358
8	0 40 30.02	1.8867	1 52 23.9	9.472	8	2 11 24.08	1.9188	9 4 9.5	8.323
9	0 42 23.21	1.8863	2 1 51.9	9.460	9	2 13 19.26	1.9206	9 12 27.8	8.287
10	0 44 16.37	1.8858	2 11 19.1	9.448	10	2 15 14.55	1.9224	9 20 43.9	8.249
11	0 46 9.50	1.8854	2 20 45.6	9.435	11	2 17 9.95	1.9243	9 28 57.7	8.212
12	0 48 2.62	1.8852	2 30 11.3	9.422	12	2 19 5.47	1.9263	9 37 9.3	8.174
13	0 49 55.72	1.8849	2 39 36.2	9.408	13	2 21 1.10	1.9282	9 45 18.6	8.135
14	0 51 48.81	1.8847	2 49 0.2	9.393	14	2 22 56.85	1.9301	9 53 25.5	8.096
15	0 53 41.88	1.8845	2 58 23.3	9.378	15	2 24 52.71	1.9321	10 1 30.1	8.057
16	0 55 34.95	1.8844	3 7 45.5	9.362	16	2 26 48.70	1.9342	10 9 32.3	8.016
17	0 57 28.01	1.8843	3 17 6.7	9.345	17	2 28 44.81	1.9362	10 17 32.0	7.975
18	0 59 21.06	1.8843	3 26 26.9	9.329	18	2 30 41.04	1.9383	10 25 29.3	7.934
19	1 1 14.12	1.8843	3 35 46.2	9.312	19	2 32 37.40	1.9404	10 33 24.1	7.892
20	1 3 7.18	1.8844	3 45 4.4	9.294	20	2 34 33.89	1.9427	10 41 16.3	7.849
21	1 5 0.25	1.8846	3 54 21.5	9.276	21	2 36 30.52	1.9449	10 49 6.0	7.807
22	1 6 53.33	1.8848	4 3 37.5	9.257	22	2 38 27.28	1.9471	10 56 53.1	7.763
23	1 8 46.42	1.8849	4 12 52.4	9.238	23	2 40 24.17	1.9494	11 4 37.6	7.719
24	1 10 39.52	1.8852	+4 22 6.1	+9.218	24	2 42 21.21	1.9517	+11 12 19.4	+7.674

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 8.					JULY 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 42 21.21	1.9517	+11 12 19.4	+7.674	0	4 19 13.81	2.0921	+16 18 14.8	+4.843
1	2 44 18.38	1.9541	11 19 58.5	7.629	1	4 21 19.43	2.0953	16 23 3.2	4.770
2	2 46 15.70	1.9565	11 27 34.9	7.583	2	4 23 25.24	2.0985	16 27 47.2	4.696
3	2 48 13.16	1.9589	11 35 8.5	7.537	3	4 25 31.25	2.1018	16 32 26.7	4.621
4	2 50 10.77	1.9614	11 42 39.3	7.490	4	4 27 37.46	2.1050	16 37 1.7	4.545
5	2 52 8.53	1.9639	11 50 7.3	7.442	5	4 29 43.85	2.1083	16 41 32.1	4.469
6	2 54 6.44	1.9664	11 57 32.4	7.394	6	4 31 50.45	2.1116	16 45 58.0	4.392
7	2 56 4.50	1.9689	12 4 54.6	7.346	7	4 33 57.24	2.1148	16 50 19.2	4.315
8	2 58 2.71	1.9715	12 12 13.9	7.297	8	4 36 4.22	2.1180	16 54 35.8	4.237
9	3 0 1.08	1.9742	12 19 30.2	7.247	9	4 38 11.40	2.1213	16 58 47.7	4.159
10	3 1 59.61	1.9768	12 26 43.5	7.197	10	4 40 18.77	2.1244	17 2 54.9	4.080
11	3 3 58.29	1.9794	12 33 53.8	7.146	11	4 42 26.33	2.1277	17 6 57.3	4.000
12	3 5 57.14	1.9822	12 41 1.0	7.094	12	4 44 34.09	2.1308	17 10 54.9	3.920
13	3 7 56.15	1.9848	12 48 5.1	7.042	13	4 46 42.03	2.1340	17 14 47.7	3.839
14	3 9 55.32	1.9876	12 55 6.1	6.990	14	4 48 50.17	2.1372	17 18 35.6	3.758
15	3 11 54.66	1.9904	13 2 3.9	6.936	15	4 50 58.49	2.1403	17 22 18.6	3.676
16	3 13 54.17	1.9932	13 8 58.4	6.882	16	4 53 7.01	2.1435	17 25 56.7	3.594
17	3 15 53.84	1.9960	13 15 49.7	6.828	17	4 55 15.71	2.1466	17 29 29.9	3.511
18	3 17 53.69	1.9989	13 22 37.8	6.773	18	4 57 24.60	2.1497	17 32 58.0	3.427
19	3 19 53.71	2.0018	13 29 22.5	6.718	19	4 59 33.67	2.1528	17 36 21.1	3.343
20	3 21 53.90	2.0047	13 36 3.9	6.662	20	5 1 42.93	2.1559	17 39 39.1	3.258
21	3 23 54.27	2.0075	13 42 41.9	6.605	21	5 3 52.38	2.1590	17 42 52.1	3.173
22	3 25 54.80	2.0104	13 49 16.5	6.547	22	5 6 2.01	2.1620	17 45 59.9	3.088
23	3 27 55.52	2.0135	+13 55 47.6	+6.489	23	5 8 11.82	2.1650	+17 49 2.6	+3.002
JULY 9.					JULY 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 29 56.42	2.0165	+14 2 15.2	+6.431	0	5 10 21.81	2.1680	+17 52 0.1	+2.915
1	3 31 57.50	2.0195	14 8 39.3	6.372	1	5 12 31.98	2.1710	17 54 52.4	2.827
2	3 33 58.76	2.0225	14 14 59.8	6.312	2	5 14 42.33	2.1740	17 57 39.4	2.739
3	3 36 0.20	2.0255	14 21 16.7	6.252	3	5 16 52.86	2.1770	18 0 21.1	2.651
4	3 38 1.82	2.0286	14 27 30.0	6.191	4	5 19 3.57	2.1799	18 2 57.5	2.562
5	3 40 3.63	2.0317	14 33 39.6	6.129	5	5 21 14.45	2.1828	18 5 28.5	2.473
6	3 42 5.62	2.0347	14 39 45.5	6.067	6	5 23 25.51	2.1857	18 7 54.2	2.383
7	3 44 7.79	2.0378	14 45 47.6	6.003	7	5 25 36.73	2.1885	18 10 14.5	2.293
8	3 46 10.15	2.0408	14 51 45.9	5.941	8	5 27 48.13	2.1914	18 12 29.3	2.202
9	3 48 12.69	2.0439	14 57 40.5	5.877	9	5 29 59.70	2.1942	18 14 38.7	2.110
10	3 50 15.42	2.0471	15 3 31.1	5.812	10	5 32 11.43	2.1969	18 16 42.5	2.018
11	3 52 18.34	2.0503	15 9 17.9	5.747	11	5 34 23.33	2.1997	18 18 40.9	1.927
12	3 54 21.45	2.0534	15 15 0.7	5.681	12	5 36 35.39	2.2023	18 20 33.7	1.833
13	3 56 24.75	2.0567	15 20 39.6	5.614	13	5 38 47.61	2.2051	18 22 20.9	1.740
14	3 58 28.25	2.0599	15 26 14.4	5.547	14	5 41 0.00	2.2078	18 24 2.5	1.647
15	4 0 31.94	2.0631	15 31 45.2	5.480	15	5 43 12.54	2.2103	18 25 38.5	1.553
16	4 2 35.82	2.0663	15 37 12.0	5.412	16	5 45 25.24	2.2129	18 27 8.9	1.458
17	4 4 39.89	2.0694	15 42 34.6	5.343	17	5 47 38.09	2.2154	18 28 33.5	1.363
18	4 6 44.15	2.0727	15 47 53.1	5.273	18	5 49 51.09	2.2180	18 29 52.5	1.268
19	4 8 48.61	2.0759	15 53 7.4	5.203	19	5 52 4.25	2.2205	18 31 5.7	1.173
20	4 10 53.26	2.0792	15 58 17.5	5.132	20	5 54 17.55	2.2229	18 32 13.2	1.078
21	4 12 58.11	2.0824	16 3 23.3	5.061	21	5 56 31.00	2.2253	18 33 15.0	0.981
22	4 15 3.15	2.0856	16 8 24.8	4.989	22	5 58 44.59	2.2278	18 34 10.9	0.883
23	4 17 8.38	2.0888	16 13 22.0	4.917	23	6 0 58.33	2.2301	18 35 1.0	0.787
24	4 19 13.81	2.0921	+16 18 14.8	+4.843	24	6 3 12.20	2.2323	+18 35 45.3	+0.689

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 12.					JULY 14.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	6 3 12.20	2.2323	+18 35 45.3	+0.689	0	7 52 10.55	2.2905	+17 12 38.0	-4.175
1	6 5 26.21	2.2346	18 36 23.7	0.592	1	7 54 27.98	2.2906	17 8 24.4	4.275
2	6 7 40.35	2.2368	18 36 56.3	0.493	2	7 56 45.42	2.2906	17 4 5.0	4.373
3	6 9 54.62	2.2390	18 37 22.9	0.394	3	7 59 2.85	2.2906	16 59 39.7	4.471
4	6 12 9.03	2.2412	18 37 43.6	0.296	4	8 1 20.29	2.2906	16 55 8.5	4.570
5	6 14 23.56	2.2433	18 37 58.4	0.198	5	8 3 37.72	2.2905	16 50 31.3	4.670
6	6 16 38.22	2.2453	18 38 7.3	+0.098	6	8 5 55.15	2.2904	16 45 48.1	4.768
7	6 18 53.00	2.2473	18 38 10.2	-0.002	7	8 8 12.57	2.2903	16 40 59.1	4.865
8	6 21 7.90	2.2493	18 38 7.1	0.102	8	8 10 29.99	2.2902	16 36 4.3	4.963
9	6 23 22.92	2.2513	18 37 58.0	0.202	9	8 12 47.39	2.2898	16 31 3.5	5.061
10	6 25 38.05	2.2531	18 37 42.8	0.303	10	8 15 4.77	2.2896	16 25 57.0	5.158
11	6 27 53.29	2.2549	18 37 21.7	0.408	11	8 17 22.14	2.2893	16 20 44.6	5.254
12	6 30 8.64	2.2567	18 36 54.5	0.503	12	8 19 39.49	2.2890	16 15 26.5	5.350
13	6 32 24.09	2.2585	18 36 21.3	0.605	13	8 21 56.82	2.2886	16 10 2.6	5.446
14	6 34 39.66	2.2602	18 35 41.9	0.707	14	8 24 14.12	2.2882	16 4 33.0	5.541
15	6 36 55.32	2.2618	18 34 56.5	0.807	15	8 26 31.40	2.2877	15 58 57.7	5.636
16	6 39 11.08	2.2635	18 34 5.1	0.908	16	8 28 48.64	2.2872	15 53 16.7	5.730
17	6 41 26.94	2.2651	18 33 7.5	1.011	17	8 31 5.86	2.2868	15 47 30.1	5.824
18	6 43 42.89	2.2666	18 32 3.8	1.113	18	8 33 23.05	2.2863	15 41 37.8	5.917
19	6 45 58.93	2.2680	18 30 54.0	1.215	19	8 35 40.21	2.2857	15 35 40.0	6.009
20	6 48 15.05	2.2695	18 29 38.0	1.317	20	8 37 57.33	2.2850	15 29 36.7	6.102
21	6 50 31.27	2.2709	18 28 16.0	1.418	21	8 40 14.41	2.2844	15 23 27.3	6.194
22	6 52 47.56	2.2722	18 26 47.8	1.522	22	8 42 31.46	2.2838	15 17 13.4	6.285
23	6 55 3.93	2.2735	+18 25 13.4	-1.624	23	8 44 48.47	2.2831	+15 10 53.6	-6.376
JULY 13.					JULY 15.				
	<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>		<small>h m s</small>	<small>s</small>	<small>° ' "</small>	<small>"</small>
0	6 57 20.38	2.2748	+18 23 32.9	-1.726	0	8 47 5.43	2.2823	+15 4 28.3	-6.466
1	6 59 36.90	2.2759	18 21 46.3	1.528	1	8 49 22.35	2.2817	14 57 57.7	6.555
2	7 1 53.49	2.2771	18 19 53.5	1.932	2	8 51 39.23	2.2808	14 51 21.7	6.644
3	7 4 10.15	2.2782	18 17 54.5	2.035	3	8 53 56.05	2.2800	14 44 40.4	6.733
4	7 6 26.87	2.2793	18 15 49.3	2.137	4	8 56 12.83	2.2793	14 37 53.8	6.821
5	7 8 43.66	2.2803	18 13 38.0	2.240	5	8 58 29.56	2.2784	14 31 1.9	6.908
6	7 11 0.50	2.2812	18 11 20.5	2.343	6	9 0 46.24	2.2776	14 24 4.9	6.993
7	7 13 17.40	2.2822	18 8 56.9	2.445	7	9 3 2.87	2.2767	14 17 2.7	7.079
8	7 15 34.36	2.2830	18 6 27.1	2.548	8	9 5 19.45	2.2758	14 9 55.4	7.165
9	7 17 51.96	2.2838	18 3 51.2	2.650	9	9 7 35.97	2.2749	14 2 42.9	7.249
10	7 20 8.41	2.2846	18 1 9.1	2.753	10	9 9 52.44	2.2740	13 55 25.5	7.333
11	7 22 25.51	2.2853	17 58 20.9	2.855	11	9 12 8.85	2.2731	13 48 3.0	7.417
12	7 24 42.64	2.2859	17 55 26.5	2.958	12	9 14 25.21	2.2722	13 40 35.5	7.499
13	7 26 59.82	2.2866	17 52 26.0	3.060	13	9 16 41.51	2.2712	13 33 3.1	7.580
14	7 29 17.03	2.2872	17 49 19.3	3.162	14	9 18 57.75	2.2701	13 25 25.9	7.661
15	7 31 34.28	2.2877	17 46 6.6	3.263	15	9 21 13.92	2.2691	13 17 43.8	7.742
16	7 33 51.55	2.2882	17 42 47.7	3.366	16	9 23 30.04	2.2682	13 9 56.9	7.821
17	7 36 8.86	2.2887	17 39 22.7	3.467	17	9 25 46.10	2.2672	13 2 5.3	7.899
18	7 38 26.19	2.2890	17 35 51.7	3.568	18	9 28 2.10	2.2661	12 54 9.0	7.977
19	7 40 43.54	2.2893	17 32 14.5	3.670	19	9 30 18.03	2.2650	12 46 8.0	8.055
20	7 43 0.91	2.2897	17 28 31.3	3.770	20	9 32 33.90	2.2640	12 38 2.4	8.132
21	7 45 18.30	2.2900	17 24 42.1	3.872	21	9 34 49.71	2.2630	12 29 52.2	8.208
22	7 47 35.71	2.2902	17 20 46.7	3.973	22	9 37 5.46	2.2619	12 21 37.5	8.283
23	7 49 53.12	2.2903	17 16 45.4	4.073	23	9 39 21.14	2.2608	12 13 18.3	8.357
24	7 52 10.55	2.2905	+17 12 38.0	-4.175	24	9 41 36.76	2.2598	+12 4 54.7	-8.430

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 16.					JULY 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 41 36.76	2.2598	+12 4 54.7	-8.430	0	11 28 58.90	2.2206	+4 12 41.3	-10.878
1	9 43 52.31	2.2587	11 56 26.7	8.502	1	11 31 12.13	2.2203	4 1 47.8	10.905
2	9 46 7.80	2.2576	11 47 54.4	8.573	2	11 33 25.34	2.2200	3 50 52.7	10.931
3	9 48 23.22	2.2565	11 39 17.9	8.645	3	11 35 38.53	2.2198	3 39 56.1	10.955
4	9 50 38.58	2.2554	11 30 37.0	8.716	4	11 37 51.72	2.2197	3 28 58.1	10.978
5	9 52 53.87	2.2543	11 21 52.0	8.784	5	11 40 4.90	2.2197	3 17 58.7	11.001
6	9 55 9.10	2.2532	11 13 2.9	8.852	6	11 42 18.08	2.2196	3 6 58.0	11.023
7	9 57 24.26	2.2522	11 4 9.7	8.920	7	11 44 31.25	2.2195	2 55 56.0	11.043
8	9 59 39.36	2.2512	10 55 12.5	8.987	8	11 46 44.42	2.2195	2 44 52.9	11.062
9	10 1 54.40	2.2501	10 46 11.3	9.053	9	11 48 57.59	2.2195	2 33 48.6	11.080
10	10 4 9.37	2.2490	10 37 6.2	9.118	10	11 51 10.76	2.2196	2 22 43.3	11.097
11	10 6 24.28	2.2480	10 27 57.2	9.182	11	11 53 23.94	2.2197	2 11 37.0	11.113
12	10 8 39.13	2.2469	10 18 44.4	9.215	12	11 55 37.12	2.2198	2 0 29.7	11.128
13	10 10 53.91	2.2459	10 9 27.8	9.307	13	11 57 50.31	2.2200	1 49 21.6	11.142
14	10 13 8.64	2.2449	10 0 7.5	9.368	14	12 0 3.52	2.2202	1 38 12.6	11.155
15	10 15 23.30	2.2438	9 50 43.6	9.428	15	12 2 16.74	2.2204	1 27 3.0	11.166
16	10 17 37.89	2.2428	9 41 16.1	9.488	16	12 4 29.97	2.2207	1 15 52.7	11.177
17	10 19 52.43	2.2418	9 31 45.0	9.547	17	12 6 43.22	2.2211	1 4 41.7	11.187
18	10 22 6.91	2.2408	9 22 10.5	9.604	18	12 8 56.50	2.2215	0 53 30.3	11.195
19	10 24 21.33	2.2398	9 12 32.5	9.661	19	12 11 9.80	2.2218	0 42 18.3	11.202
20	10 26 35.69	2.2389	9 2 51.2	9.717	20	12 13 23.12	2.2222	0 31 6.0	11.208
21	10 28 50.00	2.2380	8 53 6.5	9.772	21	12 15 36.46	2.2227	0 19 53.3	11.214
22	10 31 4.25	2.2370	8 43 18.6	9.825	22	12 17 49.84	2.2233	+0 8 40.3	11.218
23	10 33 18.44	2.2361	+ 8 33 27.5	-9.878	23	12 20 3.25	2.2238	-0 2 32.9	-11.222
JULY 17.					JULY 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 35 32.58	2.2353	+ 8 23 33.2	-9.931	0	12 22 16.70	2.2244	-0 13 46.3	-11.223
1	10 37 46.67	2.2343	8 13 35.8	9.981	1	12 24 30.18	2.2251	0 24 59.7	11.224
2	10 40 0.70	2.2334	8 3 35.5	10.031	2	12 26 43.71	2.2258	0 36 13.2	11.225
3	10 42 14.68	2.2326	7 53 32.1	10.081	3	12 28 57.27	2.2264	0 47 26.7	11.223
4	10 44 28.61	2.2318	7 43 25.3	10.128	4	12 31 10.88	2.2272	0 58 40.0	11.220
5	10 46 42.49	2.2309	7 33 16.7	10.175	5	12 33 24.53	2.2280	1 9 53.1	11.217
6	10 48 56.32	2.2302	7 23 4.8	10.221	6	12 35 38.24	2.2289	1 21 6.0	11.212
7	10 51 10.11	2.2294	7 12 50.2	10.266	7	12 37 52.00	2.2293	1 32 18.5	11.206
8	10 53 23.85	2.2287	7 2 32.9	10.310	8	12 40 5.81	2.2306	1 43 30.7	11.200
9	10 55 37.55	2.2280	6 52 13.0	10.353	9	12 42 19.67	2.2316	1 54 42.5	11.192
10	10 57 51.21	2.2273	6 41 50.5	10.396	10	12 44 33.60	2.2326	2 5 53.7	11.183
11	11 0 4.82	2.2266	6 31 25.5	10.437	11	12 46 47.58	2.2336	2 17 4.4	11.173
12	11 2 18.40	2.2260	6 20 58.1	10.477	12	12 49 1.63	2.2348	2 28 14.4	11.161
13	11 4 31.94	2.2253	6 10 28.3	10.516	13	12 51 15.75	2.2358	2 39 23.7	11.149
14	11 6 45.44	2.2245	5 59 56.2	10.554	14	12 53 29.93	2.2369	2 50 32.3	11.136
15	11 8 58.91	2.2243	5 49 21.8	10.591	15	12 55 44.18	2.2382	3 1 40.0	11.120
16	11 11 12.35	2.2238	5 38 45.3	10.627	16	12 57 58.51	2.2394	3 12 46.7	11.104
17	11 13 25.76	2.2233	5 28 6.6	10.662	17	13 0 12.91	2.2406	3 23 52.5	11.088
18	11 15 39.14	2.2228	5 17 25.8	10.696	18	13 2 27.38	2.2419	3 34 57.3	11.070
19	11 17 52.49	2.2223	5 6 43.1	10.728	19	13 4 41.94	2.2433	3 46 0.9	11.051
20	11 20 5.82	2.2219	4 55 58.4	10.761	20	13 6 56.58	2.2447	3 57 3.4	11.031
21	11 22 19.12	2.2215	4 45 11.8	10.792	21	13 9 11.30	2.2461	4 8 4.6	11.010
22	11 24 32.40	2.2212	4 34 23.4	10.822	22	13 11 26.11	2.2476	4 19 4.6	10.988
23	11 26 45.66	2.2208	4 23 33.2	10.851	23	13 13 41.01	2.2491	4 30 3.1	10.963
24	11 28 58.90	2.2206	+ 4 12 41.3	-10.878	24	13 15 56.00	2.2506	-4 41 0.2	-10.939

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 20.					JULY 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 15 56.00	2.2506	- 4 41 0.2	-10.939	0	15 6 18.81	2.3569	-12 36 37.4	-8.457
1	13 18 11.08	2.2522	4 51 55.8	10.913	1	15 8 40.30	2.3595	12 45 2.5	8.380
2	13 20 26.26	2.2538	5 2 49.8	10.887	2	15 11 1.95	2.3621	12 53 23.0	8.302
3	13 22 41.53	2.2554	5 13 42.2	10.859	3	15 13 23.75	2.3647	13 1 38.7	8.221
4	13 24 56.91	2.2572	5 24 32.9	10.829	4	15 15 45.71	2.3672	13 9 49.5	8.139
5	13 27 12.39	2.2588	5 35 21.7	10.799	5	15 18 7.81	2.3697	13 17 55.4	8.057
6	13 29 27.97	2.2606	5 46 8.8	10.768	6	15 20 30.07	2.3723	13 25 56.4	7.975
7	13 31 43.66	2.2623	5 56 53.9	10.736	7	15 22 52.49	2.3748	13 33 52.4	7.891
8	13 33 59.45	2.2642	6 7 37.1	10.702	8	15 25 15.05	2.3773	13 41 43.3	7.806
9	13 36 15.36	2.2661	6 18 18.1	10.667	9	15 27 37.76	2.3798	13 49 29.1	7.721
10	13 38 31.38	2.2679	6 28 57.1	10.632	10	15 30 0.63	2.3823	13 57 9.8	7.634
11	13 40 47.51	2.2698	6 39 33.9	10.595	11	15 32 23.64	2.3848	14 4 45.2	7.546
12	13 43 3.76	2.2718	6 50 8.5	10.557	12	15 34 46.80	2.3873	14 12 15.3	7.457
13	13 45 20.13	2.2738	7 0 40.7	10.518	13	15 37 10.11	2.3898	14 19 40.1	7.367
14	13 47 36.61	2.2758	7 11 10.6	10.478	14	15 39 33.57	2.3922	14 26 59.4	7.277
15	13 49 53.22	2.2779	7 21 38.1	10.437	15	15 41 57.17	2.3945	14 34 13.3	7.186
16	13 52 9.96	2.2799	7 32 3.0	10.393	16	15 44 20.91	2.3969	14 41 21.7	7.093
17	13 54 26.81	2.2820	7 42 25.3	10.350	17	15 46 44.80	2.3993	14 48 24.5	7.000
18	13 56 43.80	2.2842	7 52 45.0	10.305	18	15 49 8.83	2.4016	14 55 21.7	6.907
19	13 59 0.91	2.2863	8 3 1.9	10.259	19	15 51 32.99	2.4039	15 2 13.3	6.812
20	14 1 18.15	2.2884	8 13 16.1	10.213	20	15 53 57.30	2.4063	15 8 59.1	6.716
21	14 3 35.52	2.2907	8 23 27.5	10.165	21	15 56 21.74	2.4085	15 15 39.2	6.619
22	14 5 53.03	2.2930	8 33 35.9	10.115	22	15 58 46.32	2.4108	15 22 13.4	6.522
23	14 8 10.68	2.2952	- 8 43 41.3	-10.065	23	16 1 11.03	2.4130	-15 28 41.8	-6.423
JULY 21.					JULY 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 10 28.46	2.2974	- 8 53 43.7	-10.014	0	16 3 35.88	2.4152	-15 35 4.2	-6.324
1	14 12 46.37	2.2997	9 3 43.0	9.962	1	16 6 0.85	2.4173	15 41 20.7	6.224
2	14 15 4.43	2.3021	9 13 39.1	9.908	2	16 8 25.95	2.4193	15 47 31.1	6.123
3	14 17 22.62	2.3044	9 23 31.9	9.853	3	16 10 51.17	2.4214	15 53 35.5	6.022
4	14 19 40.96	2.3068	9 33 21.5	9.798	4	16 13 16.52	2.4235	15 59 33.8	5.920
5	14 21 59.44	2.3092	9 43 7.7	9.741	5	16 15 41.99	2.4254	16 5 25.9	5.817
6	14 24 18.06	2.3116	9 52 50.4	9.683	6	16 18 7.57	2.4273	16 11 11.9	5.714
7	14 26 36.83	2.3140	10 2 29.7	9.624	7	16 20 33.27	2.4293	16 16 51.6	5.609
8	14 28 55.74	2.3164	10 12 5.3	9.563	8	16 22 59.09	2.4312	16 22 25.0	5.504
9	14 31 14.80	2.3189	10 21 37.3	9.503	9	16 25 25.01	2.4330	16 27 52.1	5.398
10	14 33 34.01	2.3213	10 31 5.7	9.441	10	16 27 51.05	2.4348	16 33 12.8	5.292
11	14 35 53.36	2.3238	10 40 30.2	9.377	11	16 30 17.19	2.4365	16 38 27.1	5.184
12	14 38 12.87	2.3264	10 49 50.9	9.313	12	16 32 43.43	2.4382	16 43 34.9	5.077
13	14 40 32.53	2.3288	10 59 7.7	9.248	13	16 35 9.77	2.4398	16 48 36.3	4.968
14	14 42 52.33	2.3313	11 8 20.6	9.181	14	16 37 36.21	2.4414	16 53 31.1	4.859
15	14 45 12.29	2.3339	11 17 29.4	9.113	15	16 40 2.74	2.4429	16 58 19.4	4.750
16	14 47 32.40	2.3365	11 26 34.2	9.045	16	16 42 29.36	2.4444	17 3 1.1	4.640
17	14 49 52.67	2.3390	11 35 34.8	8.974	17	16 44 56.07	2.4459	17 7 36.2	4.529
18	14 52 13.08	2.3415	11 44 31.1	8.903	18	16 47 22.87	2.4473	17 12 4.6	4.417
19	14 54 33.65	2.3441	11 53 23.2	8.832	19	16 49 49.74	2.4485	17 16 26.3	4.306
20	14 56 54.37	2.3467	12 2 11.0	8.760	20	16 52 16.69	2.4498	17 20 41.3	4.193
21	14 59 15.25	2.3493	12 10 54.4	8.686	21	16 54 43.72	2.4510	17 24 49.5	4.080
22	15 1 36.29	2.3518	12 19 33.3	8.610	22	16 57 10.81	2.4521	17 28 50.9	3.967
23	15 3 57.47	2.3543	12 28 7.6	8.534	23	16 59 37.97	2.4532	17 32 45.5	3.853
24	15 6 18.81	2.3569	-12 36 37.4	-8.457	24	17 2 5.20	2.4543	-17 30 33.3	-3.739

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
JULY 24.							JULY 26.										
	h	m	s	s	°	'	''		h	m	s	s	°	'	''	''	
0	17	2	5.20	2.4513	-17	36	33.3	-3.739	0	18	59	45.20	2.4206	-18	20	19.3	+1.903
1	17	4	32.48	2.4553	17	40	14.2	3.624	1	19	2	10.36	2.4151	18	18	21.8	2.015
2	17	6	59.83	2.4562	17	43	48.2	3.508	2	19	4	35.37	2.4155	18	16	17.5	2.128
3	17	9	27.22	2.4569	17	47	15.2	3.393	3	19	7	0.22	2.4129	18	14	6.4	2.240
4	17	11	54.66	2.4577	17	50	35.3	3.278	4	19	9	24.92	2.4102	18	11	48.7	2.355
5	17	14	22.15	2.4584	17	53	48.5	3.162	5	19	11	49.45	2.4075	18	9	24.3	2.462
6	17	16	49.67	2.4590	17	56	51.7	3.044	6	19	14	13.82	2.4048	18	6	53.3	2.572
7	17	19	17.23	2.4597	17	59	53.8	2.927	7	19	16	38.02	2.4019	18	4	15.7	2.681
8	17	21	44.83	2.4602	18	2	46.0	2.811	8	19	19	2.05	2.3991	18	1	31.6	2.790
9	17	24	12.45	2.4605	18	5	31.1	2.693	9	19	21	25.91	2.3961	17	58	40.9	2.898
10	17	26	40.09	2.4609	18	8	9.1	2.575	10	19	23	49.58	2.3930	17	55	43.8	3.006
11	17	29	7.76	2.4612	18	10	40.1	2.457	11	19	26	13.07	2.3899	17	52	40.2	3.113
12	17	31	35.44	2.4611	18	13	3.9	2.338	12	19	28	36.37	2.3868	17	49	30.2	3.220
13	17	34	3.13	2.4616	18	15	20.7	2.220	13	19	30	59.48	2.3836	17	46	13.8	3.326
14	17	36	30.83	2.4618	18	17	30.3	2.102	14	19	33	22.40	2.3803	17	42	51.1	3.430
15	17	38	58.54	2.4618	18	19	32.9	1.983	15	19	35	45.12	2.3771	17	39	22.2	3.534
16	17	41	26.24	2.4616	18	21	28.3	1.863	16	19	38	7.65	2.3738	17	35	47.0	3.638
17	17	43	53.93	2.4615	18	23	16.5	1.741	17	19	40	29.97	2.3703	17	32	5.6	3.741
18	17	46	21.62	2.4613	18	24	57.6	1.625	18	19	42	52.08	2.3668	17	28	18.1	3.843
19	17	48	49.29	2.4610	18	26	31.5	1.506	19	19	45	13.99	2.3634	17	24	24.4	3.943
20	17	51	16.94	2.4607	18	27	58.3	1.387	20	19	47	35.69	2.3598	17	20	24.7	4.045
21	17	53	44.57	2.4602	18	29	18.0	1.268	21	19	49	57.17	2.3562	17	16	19.0	4.145
22	17	56	12.16	2.4597	18	30	30.4	1.148	22	19	52	18.44	2.3526	17	12	7.3	4.244
23	17	58	39.73	2.4592	-18	31	35.7	-1.028	23	19	54	39.48	2.3489	-17	7	49.7	+1.342
JULY 25.							JULY 27.										
0	18	1	7.26	2.4585	-18	32	33.8	-0.908	0	19	57	0.31	2.3452	-17	3	26.2	+4.440
1	18	3	34.75	2.4578	18	33	24.7	0.789	1	19	59	20.91	2.3414	16	58	56.9	4.537
2	18	6	2.19	2.4570	18	34	8.5	0.670	2	20	1	41.28	2.3377	16	54	21.8	4.633
3	18	8	29.59	2.4561	18	34	45.1	0.550	3	20	4	1.43	2.3338	16	49	40.9	4.728
4	18	10	56.92	2.4551	18	35	14.5	0.431	4	20	6	21.34	2.3299	16	44	54.4	4.822
5	18	13	24.20	2.4541	18	35	36.8	0.312	5	20	8	41.02	2.3261	16	40	2.3	4.915
6	18	15	51.41	2.4530	18	35	52.0	0.194	6	20	11	0.47	2.3222	16	35	4.6	5.007
7	18	18	18.56	2.4518	18	36	0.1	-0.075	7	20	13	19.68	2.3182	16	30	1.4	5.099
8	18	20	45.63	2.4505	18	36	1.0	+0.044	8	20	15	38.65	2.3141	16	24	52.7	5.190
9	18	23	12.62	2.4492	18	35	54.8	0.163	9	20	17	57.37	2.3101	16	19	38.6	5.280
10	18	25	39.53	2.4478	18	35	41.5	0.291	10	20	20	15.86	2.3061	16	14	19.1	5.369
11	18	28	6.35	2.4463	18	35	21.1	0.399	11	20	22	34.10	2.3019	16	8	54.3	5.457
12	18	30	33.09	2.4448	18	34	53.6	0.517	12	20	24	52.09	2.2978	16	3	24.3	5.544
13	18	32	59.73	2.4432	18	34	19.1	0.634	13	20	27	9.83	2.2937	15	57	49.0	5.631
14	18	35	26.27	2.4414	18	33	37.5	0.752	14	20	29	27.33	2.2895	15	52	8.6	5.716
15	18	37	52.70	2.4396	18	32	48.9	0.868	15	20	31	44.57	2.2853	15	46	23.1	5.801
16	18	40	19.02	2.4378	18	31	53.4	0.984	16	20	34	1.57	2.2812	15	40	32.5	5.881
17	18	42	45.23	2.4359	18	30	50.8	1.101	17	20	36	18.31	2.2768	15	34	37.0	5.967
18	18	45	11.33	2.4339	18	29	41.3	1.217	18	20	38	34.79	2.2727	15	28	36.5	6.048
19	18	47	37.30	2.4318	18	28	24.8	1.332	19	20	40	51.03	2.2684	15	22	31.2	6.128
20	18	50	3.14	2.4297	18	27	1.4	1.447	20	20	43	7.00	2.2641	15	16	21.1	6.209
21	18	52	28.86	2.4276	18	25	31.2	1.561	21	20	45	22.72	2.2598	15	10	6.1	6.288
22	18	54	54.45	2.4253	18	23	54.1	1.676	22	20	47	38.17	2.2554	15	3	46.5	6.365
23	18	57	19.89	2.4229	18	22	10.1	1.790	23	20	49	53.37	2.2512	14	57	22.3	6.442
24	18	59	45.20	2.4206	-18	20	19.3	+1.903	24	20	52	8.31	2.2468	-14	50	53.4	+6.519

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
JULY 28.					JULY 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 52 8.31	2.2468	-14 50 53.4	+6.519	0	22 35 4.01	2.0479	-8 28 35.7	+9.051
1	20 54 22.99	2.2425	14 44 20.0	6.593	1	22 37 6.78	2.0443	8 19 31.7	9.082
2	20 56 37.41	2.2382	14 37 42.2	6.667	2	22 39 9.33	2.0408	8 10 25.9	9.111
3	20 58 51.57	2.2338	14 30 59.9	6.741	3	22 41 11.67	2.0373	8 1 18.4	9.140
4	21 1 5.46	2.2294	14 24 13.3	6.813	4	22 43 13.80	2.0338	7 52 9.1	9.168
5	21 3 19.10	2.2251	14 17 22.3	6.885	5	22 45 15.72	2.0303	7 42 58.2	9.195
6	21 5 32.47	2.2207	14 10 27.1	6.955	6	22 47 17.43	2.0268	7 33 45.7	9.222
7	21 7 45.58	2.2163	14 3 27.7	7.023	7	22 49 18.94	2.0235	7 24 31.6	9.248
8	21 9 58.43	2.2120	13 56 24.3	7.092	8	22 51 20.25	2.0203	7 15 16.0	9.273
9	21 12 11.02	2.2077	13 49 16.7	7.160	9	22 53 21.37	2.0169	7 5 58.9	9.296
10	21 14 23.35	2.2033	13 42 5.1	7.227	10	22 55 22.28	2.0136	6 56 40.5	9.319
11	21 16 35.41	2.1988	13 34 49.5	7.292	11	22 57 23.00	2.0104	6 47 20.6	9.342
12	21 18 47.21	2.1945	13 27 30.1	7.356	12	22 59 23.53	2.0073	6 37 59.5	9.363
13	21 20 58.75	2.1902	13 20 6.8	7.419	13	23 1 23.87	2.0041	6 28 37.1	9.384
14	21 23 10.03	2.1858	13 12 39.8	7.482	14	23 3 24.02	2.0010	6 19 13.4	9.404
15	21 25 21.04	2.1813	13 5 9.0	7.543	15	23 5 23.99	1.9979	6 9 48.6	9.423
16	21 27 31.79	2.1771	12 57 34.6	7.604	16	23 7 23.77	1.9949	6 0 22.6	9.442
17	21 29 42.29	2.1728	12 49 56.5	7.664	17	23 9 23.38	1.9919	5 50 55.6	9.459
18	21 31 52.53	2.1684	12 42 14.9	7.722	18	23 11 22.80	1.9889	5 41 27.5	9.477
19	21 34 2.50	2.1641	12 34 29.8	7.780	19	23 13 22.05	1.9861	5 31 58.3	9.493
20	21 36 12.22	2.1598	12 26 41.3	7.837	20	23 15 21.13	1.9833	5 22 28.3	9.508
21	21 38 21.68	2.1556	12 18 49.4	7.893	21	23 17 20.04	1.9804	5 12 57.3	9.523
22	21 40 30.89	2.1513	12 10 54.2	7.948	22	23 19 18.78	1.9777	5 3 25.5	9.537
23	21 42 39.84	2.1470	-12 2 55.7	+8.002	23	23 21 17.36	1.9749	-4 53 52.8	+9.551
JULY 29.					JULY 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 44 48.53	2.1428	-11 54 54.0	+8.054	0	23 23 15.77	1.9722	-4 44 19.4	+9.563
1	21 46 56.97	2.1386	11 46 49.2	8.107	1	23 25 14.02	1.9696	4 34 45.2	9.575
2	21 49 5.16	2.1343	11 38 41.2	8.158	2	23 27 12.12	1.9670	4 25 10.4	9.586
3	21 51 13.09	2.1302	11 30 30.3	8.208	3	23 29 10.06	1.9644	4 15 34.9	9.597
4	21 53 20.78	2.1260	11 22 16.3	8.257	4	23 31 7.85	1.9620	4 5 58.8	9.607
5	21 55 28.21	2.1218	11 13 59.4	8.305	5	23 33 5.50	1.9595	3 56 22.1	9.616
6	21 57 35.40	2.1178	11 5 39.7	8.352	6	23 35 2.99	1.9570	3 46 44.9	9.624
7	21 59 42.35	2.1137	10 57 17.1	8.399	7	23 37 0.34	1.9547	3 37 7.2	9.632
8	22 1 49.04	2.1095	10 48 51.8	8.444	8	23 38 57.55	1.9524	3 27 29.1	9.639
9	22 3 55.49	2.1055	10 40 23.8	8.489	9	23 40 54.63	1.9502	3 17 50.5	9.646
10	22 6 1.70	2.1015	10 31 53.1	8.533	10	23 42 51.57	1.9478	3 8 11.6	9.651
11	22 8 7.67	2.0974	10 23 19.8	8.576	11	23 44 48.37	1.9456	2 58 32.4	9.656
12	22 10 13.39	2.0934	10 14 44.0	8.618	12	23 46 45.04	1.9435	2 48 52.9	9.661
13	22 12 18.88	2.0895	10 6 5.7	8.658	13	23 48 41.59	1.9414	2 39 13.1	9.664
14	22 14 24.13	2.0855	9 57 25.0	8.698	14	23 50 38.01	1.9393	2 29 33.2	9.667
15	22 16 29.14	2.0817	9 48 41.9	8.737	15	23 52 34.30	1.9373	2 19 53.1	9.670
16	22 18 33.93	2.0778	9 39 56.5	8.776	16	23 54 30.48	1.9354	2 10 12.8	9.672
17	22 20 38.48	2.0739	9 31 8.8	8.813	17	23 56 26.55	1.9334	2 0 32.5	9.673
18	22 22 42.80	2.0701	9 22 18.9	8.850	18	23 58 22.49	1.9315	1 50 52.1	9.673
19	22 24 46.89	2.0663	9 13 26.8	8.886	19	0 0 18.33	1.9297	1 41 11.7	9.673
20	22 26 50.76	2.0627	9 4 32.6	8.921	20	0 2 14.06	1.9280	1 31 31.3	9.672
21	22 28 54.41	2.0589	8 55 36.3	8.954	21	0 4 9.69	1.9263	1 21 51.0	9.671
22	22 30 57.83	2.0552	8 46 38.1	8.987	22	0 6 5.21	1.9245	1 12 10.8	9.669
23	22 33 1.03	2.0515	8 37 37.8	9.020	23	0 8 0.63	1.9229	1 2 30.7	9.667
24	22 35 4.01	2.0479	-8 28 35.7	+9.051	24	0 9 55.96	1.9213	-0 52 50.8	+9.663

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 1.					AUGUST 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 9 55.96	1.9213	-0 52 50.8	+9.663	0	1 41 13.49	1.9005	+ 6 36 35.5	+8.858
1	0 11 51.19	1.9198	0 43 11.1	9.660	1	1 43 7.54	1.9012	6 45 26.1	8.829
2	0 13 46.34	1.9183	0 33 31.6	9.655	2	1 45 1.64	1.9020	6 54 15.0	8.799
3	0 15 41.39	1.9168	0 23 52.5	9.650	3	1 46 55.78	1.9028	7 3 2.0	8.768
4	0 17 36.36	1.9154	0 14 13.6	9.645	4	1 48 49.97	1.9036	7 11 47.2	8.738
5	0 19 31.24	1.9141	-0 4 35.1	9.638	5	1 50 44.21	1.9045	7 20 30.6	8.707
6	0 21 26.05	1.9128	+0 5 3.0	9.632	6	1 52 38.51	1.9055	7 29 12.0	8.673
7	0 23 20.78	1.9115	0 14 40.7	9.624	7	1 54 32.87	1.9064	7 37 51.4	8.642
8	0 25 15.43	1.9103	0 24 17.9	9.617	8	1 56 27.28	1.9073	7 46 29.0	8.609
9	0 27 10.01	1.9092	0 33 54.7	9.608	9	1 58 21.75	1.9084	7 55 4.5	8.575
10	0 29 4.53	1.9080	0 43 30.9	9.598	10	2 0 16.29	1.9095	8 3 38.0	8.541
11	0 30 58.97	1.9069	0 53 6.5	9.589	11	2 2 10.89	1.9107	8 12 9.4	8.507
12	0 32 53.36	1.9060	1 2 41.6	9.580	12	2 4 5.57	1.9119	8 20 38.8	8.472
13	0 34 47.69	1.9050	1 12 16.1	9.568	13	2 6 0.32	1.9131	8 29 6.1	8.437
14	0 36 41.96	1.9040	1 21 49.8	9.557	14	2 7 55.14	1.9143	8 37 31.2	8.400
15	0 38 36.17	1.9032	1 31 22.9	9.546	15	2 9 50.03	1.9156	8 45 54.1	8.363
16	0 40 30.34	1.9023	1 40 55.3	9.533	16	2 11 45.01	1.9170	8 54 14.8	8.327
17	0 42 24.45	1.9015	1 50 26.8	9.519	17	2 13 40.07	1.9184	9 2 33.3	8.289
18	0 44 18.52	1.9008	1 59 57.6	9.507	18	2 15 35.22	1.9198	9 10 49.5	8.252
19	0 46 12.55	1.9002	2 9 27.6	9.493	19	2 17 30.45	1.9213	9 19 3.5	8.213
20	0 48 6.54	1.8995	2 18 56.7	9.478	20	2 19 25.77	1.9228	9 27 15.1	8.174
21	0 50 0.49	1.8989	2 28 24.9	9.463	21	2 21 21.18	1.9243	9 35 24.4	8.135
22	0 51 54.41	1.8983	2 37 52.2	9.447	22	2 23 16.69	1.9259	9 43 31.3	8.094
23	0 53 48.29	1.8978	+2 47 18.5	+9.431	23	2 25 12.29	1.9275	+ 9 51 35.7	+8.054
AUGUST 2.					AUGUST 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 55 42.15	1.8974	+2 56 43.9	+9.414	0	2 27 7.99	1.9292	+ 9 59 37.8	+8.014
1	0 57 35.98	1.8970	3 6 8.2	9.397	1	2 29 3.79	1.9309	10 7 37.4	7.972
2	0 59 29.79	1.8967	3 15 31.5	9.379	2	2 30 59.70	1.9327	10 15 34.4	7.930
3	1 1 23.58	1.8963	3 24 53.7	9.361	3	2 32 55.71	1.9344	10 23 29.0	7.887
4	1 3 17.35	1.8961	3 34 14.8	9.342	4	2 34 51.83	1.9363	10 31 20.9	7.844
5	1 5 11.11	1.8959	3 43 34.8	9.323	5	2 36 48.07	1.9382	10 39 10.3	7.802
6	1 7 4.86	1.8957	3 52 53.5	9.303	6	2 38 44.41	1.9400	10 46 57.1	7.758
7	1 8 58.59	1.8955	4 2 11.1	9.283	7	2 40 40.87	1.9419	10 54 41.2	7.713
8	1 10 52.32	1.8955	4 11 27.5	9.262	8	2 42 37.44	1.9438	11 2 22.6	7.668
9	1 12 46.05	1.8955	4 20 42.5	9.240	9	2 44 34.13	1.9459	11 10 1.3	7.622
10	1 14 39.78	1.8955	4 29 56.3	9.218	10	2 46 30.95	1.9480	11 17 37.2	7.576
11	1 16 33.51	1.8956	4 39 8.7	9.196	11	2 48 27.89	1.9500	11 25 10.4	7.529
12	1 18 27.25	1.8957	4 48 19.8	9.173	12	2 50 24.95	1.9521	11 32 40.7	7.482
13	1 20 20.99	1.8958	4 57 29.5	9.150	13	2 52 22.14	1.9543	11 40 8.2	7.434
14	1 22 14.75	1.8961	5 6 37.8	9.126	14	2 54 19.47	1.9565	11 47 32.8	7.386
15	1 24 8.52	1.8963	5 15 44.6	9.101	15	2 56 16.92	1.9587	11 54 54.5	7.337
16	1 26 2.30	1.8966	5 24 49.9	9.076	16	2 58 14.51	1.9609	12 2 13.3	7.288
17	1 27 56.11	1.8969	5 33 53.7	9.051	17	3 0 12.23	1.9632	12 9 29.1	7.238
18	1 29 49.93	1.8973	5 42 56.0	9.025	18	3 2 10.09	1.9655	12 16 41.9	7.188
19	1 31 43.78	1.8978	5 51 56.7	8.998	19	3 4 8.09	1.9678	12 23 51.6	7.137
20	1 33 37.66	1.8983	6 0 55.7	8.971	20	3 6 6.23	1.9702	12 30 58.3	7.086
21	1 35 31.57	1.8988	6 9 53.2	8.944	21	3 8 4.52	1.9727	12 38 1.9	7.034
22	1 37 25.51	1.8993	6 18 49.0	8.916	22	3 10 2.95	1.9751	12 45 2.4	6.982
23	1 39 19.48	1.8998	6 27 43.1	8.887	23	3 12 1.53	1.9776	12 51 59.7	6.928
24	1 41 13.49	1.9005	+6 36 35.5	+8.858	24	3 14 0.26	1.9800	+12 58 53.8	+6.875

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 5.					AUGUST 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 14 0.26	1.9800	+12 58 53.8	+6.875	0	4 52 21.75	2.1239	+17 16 49.3	+3.657
1	3 15 59.13	1.9826	13 5 44.7	6.822	1	4 54 29.28	2.1272	17 20 26.3	3.576
2	3 17 58.17	1.9852	13 12 32.4	6.767	2	4 56 37.02	2.1305	17 23 58.4	3.493
3	3 19 57.36	1.9878	13 19 16.7	6.712	3	4 58 44.94	2.1337	17 27 25.5	3.412
4	3 21 56.70	1.9903	13 25 57.8	6.657	4	5 0 53.06	2.1369	17 30 47.8	3.330
5	3 23 56.19	1.9929	13 32 35.5	6.600	5	5 3 1.37	2.1401	17 34 5.1	3.247
6	3 25 55.85	1.9957	13 39 9.8	6.542	6	5 5 9.87	2.1433	17 37 17.4	3.163
7	3 27 55.67	1.9983	13 45 40.6	6.486	7	5 7 18.56	2.1465	17 40 24.7	3.080
8	3 29 55.65	2.0010	13 52 8.1	6.428	8	5 9 27.45	2.1497	17 43 27.0	2.995
9	3 31 55.79	2.0038	13 58 32.0	6.369	9	5 11 36.52	2.1528	17 46 24.1	2.909
10	3 33 56.10	2.0066	14 4 52.4	6.311	10	5 13 45.79	2.1560	17 49 16.1	2.824
11	3 35 56.58	2.0094	14 11 9.3	6.252	11	5 15 55.24	2.1591	17 52 3.0	2.738
12	3 37 57.23	2.0122	14 17 22.6	6.192	12	5 18 4.88	2.1623	17 54 44.7	2.652
13	3 39 58.05	2.0151	14 23 32.3	6.131	13	5 20 14.71	2.1654	17 57 21.2	2.564
14	3 41 59.04	2.0179	14 29 38.3	6.069	14	5 22 24.73	2.1685	17 59 52.4	2.477
15	3 44 0.20	2.0208	14 35 40.6	6.007	15	5 24 34.93	2.1716	18 2 18.4	2.388
16	3 46 1.53	2.0237	14 41 39.2	5.945	16	5 26 45.32	2.1747	18 4 39.0	2.299
17	3 48 3.04	2.0267	14 47 34.0	5.883	17	5 28 55.90	2.1778	18 6 54.3	2.211
18	3 50 4.73	2.0296	14 53 25.1	5.820	18	5 31 6.66	2.1808	18 9 4.3	2.121
19	3 52 6.59	2.0325	14 59 12.4	5.756	19	5 33 17.60	2.1838	18 11 8.8	2.030
20	3 54 8.63	2.0355	15 4 55.8	5.691	20	5 35 28.72	2.1869	18 13 7.9	1.940
21	3 56 10.85	2.0386	15 10 35.3	5.626	21	5 37 40.03	2.1899	18 15 1.6	1.849
22	3 58 13.26	2.0416	15 16 10.9	5.560	22	5 39 51.51	2.1928	18 16 49.8	1.757
23	4 0 15.84	2.0446	+15 21 42.5	+5.493	23	5 42 3.16	2.1958	+18 18 32.5	+1.665
AUGUST 6.					AUGUST 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 2 18.61	2.0477	+15 27 10.1	+5.427	0	5 44 15.00	2.1988	+18 20 9.6	+1.573
1	4 4 21.56	2.0508	15 32 33.7	5.360	1	5 46 27.01	2.2017	18 21 41.2	1.480
2	4 6 24.70	2.0538	15 37 53.3	5.292	2	5 48 39.20	2.2046	18 23 7.2	1.386
3	4 8 28.02	2.0569	15 43 8.8	5.224	3	5 50 51.56	2.2074	18 24 27.5	1.292
4	4 10 31.53	2.0601	15 48 20.2	5.154	4	5 53 4.09	2.2102	18 25 42.3	1.198
5	4 12 35.23	2.0632	15 53 27.3	5.084	5	5 55 16.79	2.2131	18 26 51.3	1.103
6	4 14 39.11	2.0663	15 58 30.3	5.015	6	5 57 29.66	2.2158	18 27 54.6	1.008
7	4 16 43.19	2.0695	16 3 29.1	4.945	7	5 59 42.69	2.2186	18 28 52.2	0.913
8	4 18 47.45	2.0726	16 8 23.7	4.873	8	6 1 55.89	2.2213	18 29 44.1	0.817
9	4 20 51.90	2.0757	16 13 13.9	4.801	9	6 4 9.25	2.2241	18 30 30.3	0.721
10	4 22 56.54	2.0789	16 17 59.8	4.729	10	6 6 22.78	2.2268	18 31 10.6	0.623
11	4 25 1.37	2.0822	16 22 41.4	4.656	11	6 8 36.46	2.2293	18 31 45.1	0.527
12	4 27 6.40	2.0853	16 27 18.5	4.582	12	6 10 50.30	2.2320	18 32 13.8	0.430
13	4 29 11.61	2.0885	16 31 51.2	4.508	13	6 13 4.30	2.2346	18 32 36.7	0.332
14	4 31 17.02	2.0918	16 36 19.5	4.434	14	6 15 18.45	2.2371	18 32 53.7	0.233
15	4 33 22.63	2.0950	16 40 43.3	4.358	15	6 17 32.75	2.2396	18 33 4.7	0.134
16	4 35 28.42	2.0982	16 45 2.5	4.283	16	6 19 47.20	2.2422	18 33 9.8	+0.036
17	4 37 34.41	2.1014	16 49 17.2	4.207	17	6 22 1.81	2.2446	18 33 9.0	-0.063
18	4 39 40.59	2.1047	16 53 27.3	4.129	18	6 24 16.55	2.2469	18 33 2.2	0.163
19	4 41 46.97	2.1079	16 57 32.7	4.052	19	6 26 31.44	2.2494	18 32 49.4	0.263
20	4 43 53.54	2.1111	17 1 33.5	3.974	20	6 28 46.48	2.2518	18 32 30.6	0.363
21	4 46 0.30	2.1143	17 5 29.6	3.895	21	6 31 1.65	2.2540	18 32 5.8	0.463
22	4 48 7.26	2.1176	17 9 20.9	3.816	22	6 33 16.96	2.2562	18 31 35.0	0.564
23	4 50 14.41	2.1208	17 13 7.5	3.737	23	6 35 32.40	2.2585	18 30 58.1	0.665
24	4 52 21.75	2.1239	+17 16 49.3	+3.657	24	6 37 47.98	2.2608	+18 30 15.2	-0.766

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 9.					AUGUST 11.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	6 37 47.98	2.2608	+18 30 15.2	-0.766	0	8 28 3.87	2.3173	+15 54 49.7	-5.686
1	6 40 3.69	2.2629	18 29 26.2	0.868	1	8 30 22.91	2.3174	15 49 5.6	5.784
2	6 42 19.53	2.2651	18 28 31.1	0.970	2	8 32 41.96	2.3176	15 43 15.6	5.882
3	6 44 35.50	2.2672	18 27 29.8	1.072	3	8 35 1.02	2.3177	15 37 19.7	5.980
4	6 46 51.59	2.2691	18 26 22.5	1.173	4	8 37 20.08	2.3177	15 31 18.0	6.076
5	6 49 7.79	2.2711	18 25 9.0	1.276	5	8 39 39.14	2.3177	15 25 10.6	6.172
6	6 51 24.12	2.2732	18 23 49.4	1.378	6	8 41 58.20	2.3177	15 18 57.4	6.268
7	6 53 40.57	2.2751	18 22 23.6	1.482	7	8 44 17.26	2.3177	15 12 38.4	6.363
8	6 55 57.13	2.2769	18 20 51.6	1.584	8	8 46 36.32	2.3176	15 6 13.8	6.458
9	6 58 13.80	2.2788	18 19 13.5	1.687	9	8 48 55.37	2.3175	14 59 43.5	6.553
10	7 0 30.59	2.2807	18 17 29.2	1.791	10	8 51 14.42	2.3173	14 53 7.5	6.647
11	7 2 47.48	2.2823	18 15 38.6	1.894	11	8 53 33.45	2.3171	14 46 25.9	6.739
12	7 5 4.47	2.2840	18 13 41.9	1.997	12	8 55 52.47	2.3169	14 39 38.8	6.832
13	7 7 21.56	2.2857	18 11 38.9	2.101	13	8 58 11.48	2.3167	14 32 46.1	6.924
14	7 9 38.76	2.2874	18 9 29.8	2.204	14	9 0 30.47	2.3164	14 25 47.9	7.015
15	7 11 56.05	2.2889	18 7 14.4	2.309	15	9 2 49.45	2.3162	14 18 44.3	7.106
16	7 14 13.43	2.2905	18 4 52.7	2.413	16	9 5 8.41	2.3158	14 11 35.2	7.197
17	7 16 30.91	2.2921	18 2 24.9	2.516	17	9 7 27.35	2.3154	14 4 20.7	7.286
18	7 18 48.48	2.2935	17 59 50.8	2.620	18	9 9 46.26	2.3150	13 57 0.9	7.375
19	7 21 6.13	2.2949	17 57 10.5	2.723	19	9 12 5.15	2.3147	13 49 35.7	7.463
20	7 23 23.87	2.2963	17 54 24.0	2.827	20	9 14 24.03	2.3143	13 42 5.3	7.550
21	7 25 41.69	2.2976	17 51 31.2	2.932	21	9 16 42.87	2.3138	13 34 29.7	7.637
22	7 27 59.58	2.2988	17 48 32.2	3.036	22	9 19 1.69	2.3133	13 26 48.9	7.723
23	7 30 17.55	2.3002	+17 45 26.9	-3.140	23	9 21 20.47	2.3128	+13 19 2.9	-7.809
AUGUST 10.					AUGUST 12.				
0	7 32 35.60	2.3013	+17 42 15.4	-3.243	0	9 23 39.23	2.3122	+13 11 11.8	-7.893
1	7 34 53.71	2.3025	17 38 57.7	3.347	1	9 25 57.95	2.3118	13 3 15.7	7.977
2	7 37 11.90	2.3037	17 35 33.7	3.452	2	9 28 16.65	2.3113	12 55 14.5	8.061
3	7 39 30.15	2.3047	17 32 3.5	3.555	3	9 30 35.31	2.3107	12 47 8.4	8.143
4	7 41 48.46	2.3057	17 28 27.1	3.658	4	9 32 53.93	2.3101	12 38 57.4	8.223
5	7 44 6.83	2.3067	17 24 44.5	3.762	5	9 35 12.52	2.3095	12 30 41.6	8.304
6	7 46 25.26	2.3076	17 20 55.7	3.866	6	9 37 31.07	2.3088	12 22 20.9	8.385
7	7 48 43.74	2.3085	17 17 0.6	3.969	7	9 39 49.58	2.3082	12 13 55.4	8.464
8	7 51 2.28	2.3093	17 12 59.4	4.071	8	9 42 8.06	2.3077	12 5 25.2	8.542
9	7 53 20.86	2.3101	17 8 52.1	4.174	9	9 44 26.50	2.3069	11 56 50.4	8.619
10	7 55 39.49	2.3109	17 4 38.5	4.277	10	9 46 44.89	2.3062	11 48 10.9	8.696
11	7 57 58.17	2.3117	17 0 18.8	4.379	11	9 49 3.25	2.3056	11 39 26.9	8.772
12	8 0 16.89	2.3123	16 55 53.0	4.482	12	9 51 21.56	2.3048	11 30 38.3	8.847
13	8 2 35.65	2.3129	16 51 21.0	4.583	13	9 53 39.83	2.3042	11 21 45.3	8.920
14	8 4 54.44	2.3135	16 46 43.0	4.685	14	9 55 58.06	2.3034	11 12 47.9	8.993
15	8 7 13.27	2.3141	16 41 58.8	4.787	15	9 58 16.24	2.3027	11 3 46.1	9.066
16	8 9 32.13	2.3146	16 37 8.5	4.888	16	10 0 34.38	2.3020	10 54 40.0	9.137
17	8 11 51.02	2.3151	16 32 12.2	4.989	17	10 2 52.48	2.3012	10 45 29.7	9.207
18	8 14 9.94	2.3155	16 27 9.8	5.090	18	10 5 10.53	2.3004	10 36 15.2	9.277
19	8 16 28.88	2.3158	16 22 1.4	5.190	19	10 7 28.53	2.2997	10 26 56.5	9.345
20	8 18 47.84	2.3162	16 16 47.0	5.290	20	10 9 46.50	2.2991	10 17 33.8	9.412
21	8 21 6.82	2.3165	16 11 26.6	5.390	21	10 12 4.42	2.2983	10 8 7.1	9.478
22	8 23 25.82	2.3168	16 6 0.2	5.489	22	10 14 22.29	2.2974	9 58 36.4	9.544
23	8 25 44.84	2.3171	16 0 27.9	5.588	23	10 16 40.11	2.2967	9 49 1.8	9.608
24	8 28 3.87	2.3173	+15 54 49.7	-5.686	24	10 18 57.89	2.2959	+ 9 39 23.4	-9.672

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 13.					AUGUST 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 18 57.89	2.2959	+9 39 23.4	-9.672	0	12 8 26.96	2.2723	+1 2 54.5	-11.403
1	10 21 15.62	2.2952	9 29 41.2	9.734	1	12 10 43.30	2.2724	0 51 30.1	11.409
2	10 23 33.31	2.2944	9 19 55.3	9.795	2	12 12 59.65	2.2724	0 40 5.4	11.415
3	10 25 50.95	2.2936	9 10 5.8	9.856	3	12 15 15.99	2.2725	0 28 40.3	11.419
4	10 28 8.54	2.2928	9 0 12.6	9.916	4	12 17 32.35	2.2727	0 17 15.1	11.422
5	10 30 26.09	2.2922	8 50 15.9	9.973	5	12 19 48.71	2.2728	+0 5 49.7	11.425
6	10 32 43.60	2.2914	8 40 15.8	10.030	6	12 22 5.08	2.2729	-0 5 35.9	11.426
7	10 35 1.06	2.2906	8 30 12.3	10.087	7	12 24 21.46	2.2732	0 17 1.4	11.425
8	10 37 18.47	2.2898	8 20 5.4	10.142	8	12 26 37.86	2.2734	0 28 26.9	11.423
9	10 39 35.84	2.2892	8 9 55.2	10.196	9	12 28 54.27	2.2736	0 39 52.2	11.420
10	10 41 53.17	2.2884	7 59 41.9	10.248	10	12 31 10.69	2.2739	0 51 17.3	11.416
11	10 44 10.45	2.2876	7 49 25.4	10.301	11	12 33 27.14	2.2742	1 2 42.1	11.409
12	10 46 27.68	2.2868	7 39 5.8	10.352	12	12 35 43.60	2.2745	1 14 6.4	11.402
13	10 48 44.87	2.2862	7 28 43.2	10.401	13	12 38 0.08	2.2749	1 25 30.4	11.396
14	10 51 2.03	2.2856	7 18 17.7	10.449	14	12 40 16.59	2.2753	1 36 53.9	11.387
15	10 53 19.14	2.2848	7 7 49.3	10.497	15	12 42 33.12	2.2758	1 48 16.8	11.376
16	10 55 36.21	2.2842	6 57 18.1	10.543	16	12 44 49.68	2.2763	1 59 39.0	11.365
17	10 57 53.24	2.2835	6 46 44.2	10.588	17	12 47 6.27	2.2768	2 11 0.6	11.352
18	11 0 10.23	2.2828	6 36 7.6	10.632	18	12 49 22.89	2.2773	2 22 21.3	11.338
19	11 2 27.18	2.2822	6 25 28.3	10.675	19	12 51 39.54	2.2778	2 33 41.1	11.323
20	11 4 44.09	2.2816	6 14 46.6	10.716	20	12 53 56.23	2.2784	2 45 0.0	11.307
21	11 7 0.97	2.2811	6 4 2.4	10.757	21	12 56 12.95	2.2789	2 56 17.9	11.289
22	11 9 17.82	2.2805	5 53 15.7	10.797	22	12 58 29.70	2.2796	3 7 34.7	11.271
23	11 11 34.63	2.2798	+5 42 26.8	-10.834	23	13 0 46.50	2.2803	-3 18 50.4	-11.251
AUGUST 14.					AUGUST 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 13 51.40	2.2792	+5 31 35.6	-10.872	0	13 3 3.34	2.2810	-3 30 4.8	-11.229
1	11 16 8.14	2.2787	5 20 42.2	10.908	1	13 5 20.22	2.2817	3 41 17.9	11.206
2	11 18 24.84	2.2782	5 9 46.7	10.943	2	13 7 37.15	2.2825	3 52 29.5	11.182
3	11 20 41.52	2.2777	4 58 49.1	10.976	3	13 9 54.12	2.2833	4 3 39.8	11.158
4	11 22 58.17	2.2773	4 47 49.6	11.008	4	13 12 11.15	2.2842	4 14 48.5	11.132
5	11 25 14.79	2.2768	4 36 48.1	11.039	5	13 14 28.22	2.2849	4 25 55.6	11.105
6	11 27 31.39	2.2764	4 25 44.9	11.069	6	13 16 45.34	2.2858	4 37 1.1	11.077
7	11 29 47.96	2.2759	4 14 39.8	11.098	7	13 19 2.52	2.2867	4 48 4.8	11.048
8	11 32 4.50	2.2755	4 3 33.1	11.126	8	13 21 19.75	2.2877	4 59 6.8	11.017
9	11 34 21.02	2.2752	3 52 24.7	11.153	9	13 23 37.04	2.2887	5 10 6.8	10.984
10	11 36 37.52	2.2748	3 41 14.8	11.178	10	13 25 54.39	2.2897	5 21 4.9	10.952
11	11 38 53.99	2.2744	3 30 3.4	11.202	11	13 28 11.80	2.2907	5 32 1.0	10.918
12	11 41 10.45	2.2741	3 18 50.6	11.224	12	13 30 29.27	2.2917	5 42 55.1	10.882
13	11 43 26.88	2.2738	3 7 36.5	11.246	13	13 32 46.81	2.2928	5 53 46.9	10.845
14	11 45 43.31	2.2737	2 56 21.1	11.266	14	13 35 4.41	2.2938	6 4 36.5	10.807
15	11 47 59.72	2.2733	2 45 4.6	11.284	15	13 37 22.07	2.2949	6 15 23.8	10.768
16	11 50 16.11	2.2732	2 33 47.0	11.302	16	13 39 39.80	2.2962	6 26 8.7	10.728
17	11 52 32.50	2.2730	2 22 28.3	11.320	17	13 41 57.61	2.2973	6 36 51.2	10.687
18	11 54 48.87	2.2728	2 11 8.6	11.335	18	13 44 15.48	2.2985	6 47 31.2	10.645
19	11 57 5.23	2.2727	1 59 48.1	11.349	19	13 46 33.43	2.2997	6 58 8.6	10.601
20	11 59 21.59	2.2726	1 48 26.7	11.362	20	13 48 51.45	2.3009	7 8 43.3	10.557
21	12 1 37.94	2.2724	1 37 4.6	11.374	21	13 51 9.54	2.3022	7 19 15.4	10.511
22	12 3 54.28	2.2723	1 25 41.8	11.385	22	13 53 27.71	2.3035	7 29 44.6	10.463
23	12 6 10.62	2.2723	1 14 18.4	11.394	23	13 55 45.96	2.3048	7 40 11.0	10.416
24	12 8 26.96	2.2723	+1 2 54.5	-11.403	24	13 58 4.29	2.3062	-7 50 34.5	-10.367

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 17.					AUGUST 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 58 4.29	2.3062	- 7 50 34.5	-10.367	0	15 50 32.80	2.3815	-14 51 49.2	-6.821
1	14 0 22.70	2.3075	8 0 55.0	10.317	1	15 52 55.73	2.3830	14 58 35.6	6.725
2	14 2 41.19	2.3088	8 11 12.5	10.265	2	15 55 18.76	2.3844	15 5 16.2	6.629
3	14 4 59.76	2.3102	8 21 26.8	10.212	3	15 57 41.96	2.3858	15 11 51.1	6.532
4	14 7 18.42	2.3117	8 31 38.0	10.159	4	16 0 5.05	2.3872	15 18 20.1	6.435
5	14 9 37.16	2.3131	8 41 45.9	10.104	5	16 2 28.32	2.3886	15 24 43.3	6.337
6	14 11 55.99	2.3145	8 51 50.5	10.048	6	16 4 51.68	2.3899	15 31 0.5	6.238
7	14 14 14.90	2.3159	9 1 51.7	9.992	7	16 7 15.11	2.3912	15 37 11.8	6.138
8	14 16 33.90	2.3174	9 11 49.5	9.934	8	16 9 38.62	2.3925	15 43 17.1	6.038
9	14 18 52.99	2.3190	9 21 43.8	9.875	9	16 12 2.21	2.3938	15 49 16.4	5.937
10	14 21 12.18	2.3205	9 31 34.5	9.815	10	16 14 25.87	2.3950	15 55 9.6	5.836
11	14 23 31.45	2.3220	9 41 21.6	9.754	11	16 16 49.61	2.3962	16 0 56.7	5.734
12	14 25 50.82	2.3236	9 51 5.0	9.692	12	16 19 13.42	2.3974	16 6 37.7	5.632
13	14 28 10.28	2.3252	10 0 44.6	9.628	13	16 21 37.30	2.3985	16 12 12.5	5.528
14	14 30 29.84	2.3268	10 10 20.4	9.565	14	16 24 1.24	2.3996	16 17 41.1	5.425
15	14 32 49.49	2.3283	10 19 52.4	9.499	15	16 26 25.25	2.4007	16 23 3.5	5.320
16	14 35 9.23	2.3298	10 29 20.3	9.433	16	16 28 49.33	2.4018	16 28 19.5	5.215
17	14 37 29.07	2.3315	10 38 44.3	9.367	17	16 31 13.47	2.4028	16 33 29.3	5.110
18	14 39 49.01	2.3331	10 48 4.3	9.298	18	16 33 37.66	2.4037	16 38 32.7	5.004
19	14 42 9.04	2.3347	10 57 20.1	9.228	19	16 36 1.91	2.4047	16 43 29.8	4.898
20	14 44 29.17	2.3363	11 6 31.7	9.158	20	16 38 26.22	2.4056	16 48 20.5	4.791
21	14 46 49.40	2.3380	11 15 39.0	9.087	21	16 40 50.58	2.4063	16 53 4.7	4.683
22	14 49 9.73	2.3396	11 24 42.1	9.014	22	16 43 14.98	2.4072	16 57 42.5	4.576
23	14 51 30.15	2.3413	-11 33 40.7	8.941	23	16 45 39.44	2.4080	-17 2 13.8	-4.468
AUGUST 18.					AUGUST 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 53 50.68	2.3430	-11 42 35.0	-8.867	0	16 48 3.94	2.4087	-17 6 38.6	-4.359
1	14 56 11.31	2.3446	11 51 24.8	8.792	1	16 50 28.48	2.4093	17 10 56.9	4.250
2	14 58 32.03	2.3462	12 0 10.1	8.716	2	16 52 53.06	2.4100	17 15 8.6	4.140
3	15 0 52.85	2.3479	12 8 50.7	8.638	3	16 55 17.68	2.4107	17 19 13.7	4.030
4	15 3 13.78	2.3496	12 17 26.7	8.562	4	16 57 42.34	2.4112	17 23 12.2	3.920
5	15 5 34.80	2.3512	12 25 58.1	8.483	5	17 0 7.02	2.4117	17 27 4.1	3.810
6	15 7 55.92	2.3528	12 34 24.6	8.403	6	17 2 31.74	2.4122	17 30 49.4	3.700
7	15 10 17.14	2.3545	12 42 46.4	8.322	7	17 4 56.48	2.4126	17 34 28.1	3.588
8	15 12 38.46	2.3562	12 51 3.3	8.240	8	17 7 21.25	2.4130	17 38 0.0	3.476
9	15 14 59.88	2.3578	12 59 15.2	8.157	9	17 9 46.04	2.4133	17 41 25.2	3.361
10	15 17 21.40	2.3595	13 7 22.2	8.074	10	17 12 10.84	2.4135	17 44 43.7	3.252
11	15 19 43.02	2.3612	13 15 24.1	7.990	11	17 14 35.66	2.4137	17 47 55.5	3.140
12	15 22 4.74	2.3628	13 23 21.0	7.906	12	17 17 0.49	2.4139	17 51 0.5	3.027
13	15 24 26.55	2.3644	13 31 12.8	7.819	13	17 19 25.33	2.4141	17 53 58.7	2.914
14	15 26 48.47	2.3661	13 38 59.3	7.732	14	17 21 50.18	2.4141	17 56 50.2	2.802
15	15 29 10.48	2.3676	13 46 40.7	7.645	15	17 24 15.02	2.4141	17 59 34.9	2.688
16	15 31 32.58	2.3692	13 54 16.7	7.556	16	17 26 39.87	2.4142	18 2 12.7	2.574
17	15 33 54.79	2.3708	14 1 47.4	7.467	17	17 29 4.72	2.4140	18 4 43.8	2.461
18	15 36 17.08	2.3723	14 9 12.7	7.377	18	17 31 29.55	2.4138	18 7 8.0	2.347
19	15 38 39.47	2.3740	14 16 32.6	7.287	19	17 33 54.38	2.4137	18 9 25.4	2.233
20	15 41 1.96	2.3755	14 23 47.1	7.195	20	17 36 19.19	2.4134	18 11 36.0	2.119
21	15 43 24.53	2.3770	14 30 56.0	7.102	21	17 38 43.99	2.4131	18 13 39.7	2.005
22	15 45 47.20	2.3785	14 37 59.3	7.009	22	17 41 8.76	2.4127	18 15 36.6	1.891
23	15 48 9.95	2.3800	14 44 57.1	6.916	23	17 43 33.51	2.4123	18 17 26.6	1.776
24	15 50 32.80	2.3815	-14 51 49.2	-6.821	24	17 45 58.24	2.4118	-18 19 9.7	-1.662

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 21.					AUGUST 23.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 45 58.24	2.4118	-18 19 9.7	-1.662	0	19 40 8.02	2.3247	-17 29 47.5	+3.594
1	17 48 22.93	2.4113	18 20 46.0	1.548	1	19 42 27.41	2.3217	17 26 8.9	3.693
2	17 50 47.60	2.4107	18 22 15.4	1.433	2	19 44 46.62	2.3187	17 22 24.3	3.792
3	17 53 12.22	2.4101	18 23 37.9	1.318	3	19 47 5.65	2.3157	17 18 33.9	3.888
4	17 55 36.81	2.4094	18 24 53.6	1.204	4	19 49 24.50	2.3125	17 14 37.7	3.985
5	17 58 1.35	2.4087	18 26 2.4	1.089	5	19 51 43.15	2.3093	17 10 35.7	4.082
6	18 0 25.85	2.4078	18 27 4.3	0.975	6	19 54 1.62	2.3062	17 6 27.9	4.177
7	18 2 50.29	2.4069	18 27 59.4	0.861	7	19 56 19.89	2.3029	17 2 14.5	4.272
8	18 5 14.68	2.4061	18 28 47.6	0.746	8	19 58 37.97	2.2997	16 57 55.3	4.366
9	18 7 39.02	2.4051	18 29 28.9	0.632	9	20 0 55.86	2.2965	16 53 30.6	4.458
10	18 10 3.29	2.4040	18 30 3.5	0.518	10	20 3 13.55	2.2931	16 49 0.3	4.552
11	18 12 27.50	2.4029	18 30 31.1	0.403	11	20 5 31.03	2.2898	16 44 24.4	4.644
12	18 14 51.64	2.4018	18 30 51.9	0.290	12	20 7 48.32	2.2865	16 39 43.0	4.735
13	18 17 15.71	2.4006	18 31 5.9	0.177	13	20 10 5.41	2.2831	16 34 56.2	4.826
14	18 19 39.71	2.3993	18 31 13.1	-0.063	14	20 12 22.29	2.2796	16 30 3.9	4.915
15	18 22 3.62	2.3979	18 31 13.5	+0.051	15	20 14 38.96	2.2762	16 25 6.4	5.003
16	18 24 27.46	2.3966	18 31 7.0	0.164	16	20 16 55.43	2.2728	16 20 3.5	5.092
17	18 26 51.21	2.3952	18 30 53.8	0.276	17	20 19 11.69	2.2693	16 14 55.3	5.180
18	18 29 14.88	2.3937	18 30 33.9	0.389	18	20 21 27.74	2.2658	16 9 41.9	5.266
19	18 31 38.45	2.3921	18 30 7.1	0.502	19	20 23 43.58	2.2622	16 4 23.4	5.352
20	18 34 1.93	2.3905	18 29 33.7	0.613	20	20 25 59.20	2.2587	15 58 59.7	5.437
21	18 36 25.31	2.3888	18 28 53.5	0.726	21	20 28 14.62	2.2551	15 53 30.9	5.522
22	18 38 48.59	2.3872	18 28 6.6	0.838	22	20 30 29.81	2.2514	15 47 57.1	5.605
23	18 41 11.77	2.3853	-18 27 13.0	+0.949	23	20 32 44.79	2.2479	-15 42 18.3	+5.687
AUGUST 22.					AUGUST 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 43 34.83	2.3835	-18 26 12.7	+1.060	0	20 34 59.56	2.2443	-15 36 34.6	+5.769
1	18 45 57.79	2.3817	18 25 5.8	1.171	1	20 37 14.11	2.2406	15 30 46.0	5.850
2	18 48 20.63	2.3797	18 23 52.2	1.281	2	20 39 28.43	2.2369	15 24 52.6	5.931
3	18 50 43.35	2.3777	18 22 32.1	1.391	3	20 41 42.54	2.2333	15 18 54.3	6.010
4	18 53 5.95	2.3756	18 21 5.3	1.502	4	20 43 56.43	2.2297	15 12 51.4	6.088
5	18 55 28.42	2.3735	18 19 31.9	1.610	5	20 46 10.10	2.2259	15 6 43.8	6.166
6	18 57 50.77	2.3714	18 17 52.1	1.718	6	20 48 23.54	2.2222	15 0 31.5	6.243
7	19 0 12.99	2.3692	18 16 5.7	1.827	7	20 50 36.76	2.2185	14 54 14.7	6.318
8	19 2 35.08	2.3670	18 14 12.8	1.936	8	20 52 49.76	2.2148	14 47 53.3	6.394
9	19 4 57.03	2.3647	18 12 13.4	2.043	9	20 55 2.54	2.2111	14 41 27.4	6.468
10	19 7 18.84	2.3623	18 10 7.7	2.149	10	20 57 15.09	2.2073	14 34 57.1	6.542
11	19 9 40.51	2.3600	18 7 55.5	2.257	11	20 59 27.42	2.2036	14 28 22.4	6.614
12	19 12 2.04	2.3575	18 5 36.9	2.363	12	21 1 39.52	2.1998	14 21 43.4	6.686
13	19 14 23.41	2.3550	18 3 12.0	2.468	13	21 3 51.40	2.1961	14 15 0.1	6.757
14	19 16 44.64	2.3525	18 0 40.7	2.573	14	21 6 3.05	2.1924	14 8 12.5	6.827
15	19 19 5.71	2.3499	17 58 3.2	2.678	15	21 8 14.49	2.1887	14 1 20.8	6.896
16	19 21 26.63	2.3473	17 55 19.4	2.783	16	21 10 25.69	2.1848	13 54 25.0	6.964
17	19 23 47.39	2.3446	17 52 29.3	2.886	17	21 12 36.67	2.1812	13 47 25.1	7.032
18	19 26 7.98	2.3418	17 49 33.1	2.988	18	21 14 47.43	2.1774	13 40 21.1	7.099
19	19 28 28.41	2.3392	17 46 30.7	3.091	19	21 16 57.96	2.1736	13 33 13.2	7.164
20	19 30 48.68	2.3363	17 43 22.2	3.193	20	21 19 8.26	2.1698	13 26 1.4	7.229
21	19 33 8.77	2.3335	17 40 7.5	3.294	21	21 21 18.34	2.1661	13 18 45.7	7.293
22	19 35 28.70	2.3307	17 36 46.9	3.394	22	21 23 28.19	2.1624	13 11 26.3	7.356
23	19 37 48.45	2.3277	17 33 20.2	3.495	23	21 25 37.83	2.1587	13 4 3.0	7.418
24	19 40 8.02	2.3247	-17 29 47.5	+3.594	24	21 27 47.23	2.1548	-12 56 36.1	+7.479

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 25.					AUGUST 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	21 27 47.23	2.1548	-12 56 36.1	+7.479	0	23 7 12.70	1.9965	-6 3 36.5	+9.403
1	21 29 56.41	2.1512	12 49 5.5	7.540	1	23 9 12.41	1.9938	5 54 11.7	9.423
2	21 32 5.37	2.1475	12 41 31.3	7.599	2	23 11 11.96	1.9912	5 44 45.8	9.442
3	21 34 14.11	2.1438	12 33 53.6	7.657	3	23 13 11.36	1.9887	5 35 18.7	9.461
4	21 36 22.63	2.1401	12 26 12.4	7.715	4	23 15 10.60	1.9861	5 25 50.5	9.478
5	21 38 30.92	2.1363	12 18 27.8	7.772	5	23 17 9.69	1.9836	5 16 21.3	9.494
6	21 40 38.99	2.1327	12 10 39.8	7.828	6	23 19 8.63	1.9812	5 6 51.2	9.510
7	21 42 46.85	2.1291	12 2 48.4	7.883	7	23 21 7.43	1.9788	4 57 20.1	9.526
8	21 44 54.48	2.1253	11 54 53.8	7.937	8	23 23 6.08	1.9763	4 47 48.1	9.541
9	21 47 1.89	2.1217	11 46 56.0	7.991	9	23 25 4.59	1.9739	4 38 15.2	9.555
10	21 49 9.09	2.1182	11 38 54.9	8.043	10	23 27 2.95	1.9716	4 28 41.5	9.567
11	21 51 16.07	2.1145	11 30 50.8	8.094	11	23 29 1.18	1.9693	4 19 7.1	9.579
12	21 53 22.83	2.1109	11 22 43.6	8.145	12	23 30 59.27	1.9671	4 9 32.0	9.591
13	21 55 29.38	2.1073	11 14 33.4	8.195	13	23 32 57.23	1.9648	3 59 56.2	9.602
14	21 57 35.71	2.1037	11 6 20.2	8.244	14	23 34 55.05	1.9627	3 50 19.7	9.613
15	21 59 41.83	2.1002	10 58 4.1	8.292	15	23 36 52.75	1.9606	3 40 42.7	9.622
16	22 1 47.73	2.0967	10 49 45.1	8.339	16	23 38 50.32	1.9584	3 31 5.1	9.630
17	22 3 53.43	2.0932	10 41 23.4	8.385	17	23 40 47.76	1.9563	3 21 27.1	9.638
18	22 5 58.91	2.0897	10 32 58.9	8.431	18	23 42 45.08	1.9543	3 11 48.5	9.647
19	22 8 4.19	2.0862	10 24 31.7	8.476	19	23 44 42.28	1.9523	3 2 9.5	9.653
20	22 10 9.26	2.0828	10 16 1.8	8.520	20	23 46 39.36	1.9503	2 52 30.2	9.658
21	22 12 14.12	2.0793	10 7 29.3	8.562	21	23 48 36.32	1.9484	2 42 50.5	9.663
22	22 14 18.77	2.0758	9 58 54.3	8.604	22	23 50 33.17	1.9466	2 33 10.6	9.668
23	22 16 23.22	2.0725	-9 50 16.8	+8.645	23	23 52 29.91	1.9447	-2 23 30.4	+9.672
AUGUST 26.					AUGUST 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 18 27.47	2.0692	-9 41 36.9	+8.686	0	23 54 26.54	1.9429	-2 13 50.0	+9.675
1	22 20 31.52	2.0658	9 32 54.5	8.725	1	23 56 23.06	1.9412	2 4 9.4	9.677
2	22 22 35.37	2.0625	9 24 9.9	8.763	2	23 58 19.48	1.9394	1 54 28.7	9.679
3	22 24 39.02	2.0592	9 15 22.9	8.802	3	0 0 15.79	1.9378	1 44 47.9	9.680
4	22 26 42.47	2.0559	9 6 33.7	8.838	4	0 2 12.01	1.9362	1 35 7.1	9.681
5	22 28 45.73	2.0527	8 57 42.3	8.874	5	0 4 8.13	1.9345	1 25 26.2	9.681
6	22 30 48.79	2.0495	8 48 48.8	8.909	6	0 6 4.15	1.9329	1 15 45.4	9.680
7	22 32 51.67	2.0463	8 39 53.2	8.943	7	0 8 0.08	1.9314	1 6 4.6	9.678
8	22 34 54.35	2.0431	8 30 55.6	8.977	8	0 9 55.92	1.9299	0 56 24.0	9.676
9	22 36 56.84	2.0399	8 21 55.9	9.010	9	0 11 51.67	1.9285	0 46 43.5	9.673
10	22 38 59.14	2.0368	8 12 54.4	9.042	10	0 13 47.34	1.9271	0 37 3.2	9.669
11	22 41 1.26	2.0337	8 3 50.9	9.073	11	0 15 42.92	1.9257	0 27 23.2	9.665
12	22 43 3.19	2.0307	7 54 45.6	9.103	12	0 17 38.42	1.9243	0 17 43.4	9.661
13	22 45 4.94	2.0277	7 45 38.5	9.132	13	0 19 33.84	1.9231	-0 8 3.9	9.655
14	22 47 6.51	2.0247	7 36 29.7	9.161	14	0 21 29.19	1.9218	+0 1 35.2	9.649
15	22 49 7.90	2.0217	7 27 19.2	9.189	15	0 23 24.46	1.9207	0 11 14.0	9.643
16	22 51 9.12	2.0188	7 18 7.0	9.216	16	0 25 19.67	1.9196	0 20 52.3	9.636
17	22 53 10.16	2.0158	7 8 53.3	9.242	17	0 27 14.81	1.9184	0 30 30.3	9.628
18	22 55 11.02	2.0130	6 59 38.0	9.267	18	0 29 9.88	1.9173	0 40 7.7	9.618
19	22 57 11.72	2.0102	6 50 21.3	9.292	19	0 31 4.88	1.9163	0 49 44.5	9.610
20	22 59 12.24	2.0073	6 41 3.0	9.316	20	0 32 59.83	1.9153	0 59 20.9	9.601
21	23 1 12.60	2.0047	6 31 43.4	9.338	21	0 34 54.71	1.9143	1 8 56.6	9.589
22	23 3 12.80	2.0019	6 22 22.4	9.361	22	0 36 49.54	1.9133	1 18 31.6	9.578
23	23 5 12.83	1.9992	6 13 0.1	9.383	23	0 38 44.31	1.9124	1 28 6.0	9.567
24	23 7 12.70	1.9965	-6 3 36.5	+9.403	24	0 40 39.03	1.9116	+1 37 39.7	+9.556

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
AUGUST 29.					AUGUST 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 40 39.03	1.9116	+1 37 39.7	+9.555	0	2 12 11.87	1.9179	+ 8 51 34.0	+8.318
1	0 42 33.70	1.9107	1 47 12.6	9.542	1	2 14 6.98	1.9190	8 59 51.9	8.279
2	0 44 28.32	1.9100	1 56 44.8	9.529	2	2 16 2.15	1.9201	9 8 7.5	8.240
3	0 46 22.90	1.9093	2 6 16.1	9.515	3	2 17 57.39	1.9212	9 16 20.7	8.200
4	0 48 17.44	1.9087	2 15 46.6	9.501	4	2 19 52.70	1.9224	9 24 31.5	8.160
5	0 50 11.94	1.9081	2 25 16.2	9.486	5	2 21 48.08	1.9236	9 32 39.9	8.119
6	0 52 6.41	1.9074	2 34 44.9	9.470	6	2 23 43.53	1.9248	9 40 45.8	8.078
7	0 54 0.83	1.9068	2 44 12.6	9.453	7	2 25 39.06	1.9262	9 48 49.3	8.037
8	0 55 55.23	1.9063	2 53 39.3	9.436	8	2 27 34.67	1.9275	9 56 50.2	7.994
9	0 57 49.59	1.9058	3 3 4.9	9.419	9	2 29 30.36	1.9288	10 4 48.6	7.952
10	0 59 43.93	1.9054	3 12 29.6	9.402	10	2 31 26.13	1.9302	10 12 44.5	7.909
11	1 1 38.24	1.9050	3 21 53.1	9.383	11	2 33 21.98	1.9316	10 20 37.7	7.865
12	1 3 32.53	1.9047	3 31 15.5	9.363	12	2 35 17.92	1.9331	10 28 28.3	7.821
13	1 5 26.80	1.9043	3 40 36.7	9.343	13	2 37 13.95	1.9346	10 36 16.2	7.777
14	1 7 21.05	1.9040	3 49 56.7	9.323	14	2 39 10.07	1.9361	10 44 1.5	7.732
15	1 9 15.28	1.9038	3 59 15.5	9.303	15	2 41 6.28	1.9377	10 51 44.0	7.685
16	1 11 9.51	1.9037	4 8 33.1	9.282	16	2 43 2.59	1.9392	10 59 23.7	7.639
17	1 13 3.72	1.9034	4 17 49.3	9.259	17	2 44 58.99	1.9408	11 7 0.7	7.593
18	1 14 57.92	1.9033	4 27 4.2	9.237	18	2 46 55.49	1.9425	11 14 34.9	7.546
19	1 16 52.12	1.9033	4 36 17.8	9.215	19	2 48 52.09	1.9442	11 22 6.2	7.498
20	1 18 46.31	1.9033	4 45 30.0	9.191	20	2 50 48.79	1.9458	11 29 34.7	7.450
21	1 20 40.51	1.9033	4 54 40.7	9.167	21	2 52 45.59	1.9476	11 37 0.2	7.401
22	1 22 34.70	1.9033	5 3 50.0	9.142	22	2 54 42.50	1.9494	11 44 22.8	7.352
23	1 24 28.90	1.9033	+5 12 57.8	+9.117	23	2 56 39.52	1.9512	+11 51 42.5	+7.303
AUGUST 30.					SEPTEMBER 1.				
0	1 26 23.10	1.9034	+5 22 4.0	+9.091	0	2 58 36.65	1.9531	+11 58 59.2	+7.253
1	1 28 17.31	1.9036	5 31 8.7	9.065	1	3 0 33.89	1.9549	12 6 12.9	7.202
2	1 30 11.53	1.9038	5 40 11.8	9.038	2	3 2 31.24	1.9568	12 13 23.5	7.151
3	1 32 5.77	1.9041	5 49 13.3	9.011	3	3 4 28.70	1.9587	12 20 31.0	7.099
4	1 34 0.02	1.9043	5 58 13.1	8.983	4	3 6 26.28	1.9607	12 27 35.4	7.047
5	1 35 54.29	1.9047	6 7 11.2	8.955	5	3 8 23.98	1.9627	12 34 36.7	6.995
6	1 37 48.58	1.9051	6 16 7.7	8.926	6	3 10 21.80	1.9647	12 41 34.8	6.942
7	1 39 42.90	1.9054	6 25 2.3	8.896	7	3 12 19.74	1.9667	12 48 29.7	6.888
8	1 41 37.23	1.9058	6 33 55.2	8.867	8	3 14 17.81	1.9688	12 55 21.3	6.834
9	1 43 31.60	1.9063	6 42 46.3	8.836	9	3 16 16.00	1.9708	13 2 9.8	6.780
10	1 45 25.99	1.9068	6 51 35.5	8.805	10	3 18 14.31	1.9730	13 8 54.9	6.724
11	1 47 20.42	1.9074	7 0 22.9	8.773	11	3 20 12.76	1.9752	13 15 36.7	6.669
12	1 49 14.88	1.9080	7 9 8.3	8.741	12	3 22 11.33	1.9773	13 22 15.2	6.613
13	1 51 9.38	1.9086	7 17 51.8	8.708	13	3 24 10.03	1.9795	13 28 50.3	6.557
14	1 53 3.91	1.9093	7 26 33.3	8.676	14	3 26 8.87	1.9818	13 35 22.0	6.499
15	1 54 58.49	1.9100	7 35 12.9	8.643	15	3 28 7.85	1.9840	13 41 50.2	6.442
16	1 56 53.11	1.9107	7 43 50.4	8.608	16	3 30 6.95	1.9863	13 48 15.0	6.384
17	1 58 47.77	1.9114	7 52 25.9	8.574	17	3 32 6.20	1.9887	13 54 36.3	6.325
18	2 0 42.48	1.9122	8 0 59.3	8.538	18	3 34 5.59	1.9909	14 0 54.0	6.266
19	2 2 37.24	1.9131	8 9 30.5	8.503	19	3 36 5.11	1.9932	14 7 8.2	6.207
20	2 4 32.05	1.9140	8 17 59.7	8.467	20	3 38 4.78	1.9957	14 13 18.8	6.147
21	2 6 26.92	1.9150	8 26 26.6	8.430	21	3 40 4.59	1.9980	14 19 25.8	6.086
22	2 8 21.85	1.9159	8 34 51.3	8.393	22	3 42 4.54	2.0004	14 25 29.1	6.024
23	2 10 16.83	1.9168	8 43 13.8	8.356	23	3 44 4.64	2.0029	14 31 28.7	5.963
24	2 12 11.87	1.9179	+8 51 34.0	+8.318	24	3 46 4.89	2.0054	+14 37 24.7	+5.902

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 2.					SEPTEMBER 4.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 46 4.89	2.0054	+14 37 24.7	+5.902	0	5 25 27.57	2.1386	+17 59 39.8	+2.336
1	3 48 5.29	2.0078	14 43 16.9	5.838	1	5 27 35.97	2.1415	18 1 57.4	2.250
2	3 50 5.83	2.0103	14 49 5.3	5.776	2	5 29 44.55	2.1443	18 4 9.8	2.163
3	3 52 6.53	2.0128	14 54 50.0	5.713	3	5 31 53.29	2.1472	18 6 17.0	2.077
4	3 54 7.37	2.0153	15 0 30.8	5.648	4	5 34 2.21	2.1500	18 8 19.0	1.990
5	3 56 8.37	2.0180	15 6 7.7	5.583	5	5 36 11.29	2.1528	18 10 15.8	1.902
6	3 58 9.53	2.0205	15 11 40.8	5.518	6	5 38 20.55	2.1557	18 12 7.2	1.813
7	4 0 10.83	2.0231	15 17 9.9	5.453	7	5 40 29.97	2.1584	18 13 53.3	1.724
8	4 2 12.30	2.0257	15 22 35.1	5.387	8	5 42 39.56	2.1612	18 15 34.1	1.636
9	4 4 13.92	2.0284	15 27 56.3	5.320	9	5 44 49.32	2.1641	18 17 9.6	1.547
10	4 6 15.71	2.0311	15 33 13.5	5.253	10	5 46 59.25	2.1668	18 18 39.7	1.456
11	4 8 17.65	2.0337	15 38 26.6	5.185	11	5 49 9.34	2.1696	18 20 4.3	1.365
12	4 10 19.75	2.0363	15 43 35.7	5.117	12	5 51 19.60	2.1723	18 21 23.5	1.274
13	4 12 22.01	2.0391	15 48 40.7	5.049	13	5 53 30.02	2.1751	18 22 37.2	1.183
14	4 14 24.44	2.0418	15 53 41.6	4.980	14	5 55 40.61	2.1778	18 23 45.5	1.092
15	4 16 27.03	2.0445	15 58 38.3	4.910	15	5 57 51.36	2.1805	18 24 48.2	1.000
16	4 18 29.78	2.0472	16 3 30.8	4.839	16	6 0 2.27	2.1832	18 25 45.5	0.907
17	4 20 32.70	2.0500	16 8 19.0	4.769	17	6 2 13.34	2.1858	18 26 37.1	0.814
18	4 22 35.78	2.0528	16 13 3.1	4.698	18	6 4 24.57	2.1886	18 27 23.2	0.722
19	4 24 39.03	2.0556	16 17 42.8	4.626	19	6 6 35.97	2.1913	18 28 3.7	0.628
20	4 26 42.45	2.0583	16 22 18.2	4.554	20	6 8 47.52	2.1938	18 28 38.5	0.534
21	4 28 46.03	2.0611	16 26 49.3	4.482	21	6 10 59.23	2.1964	18 29 7.8	0.440
22	4 30 49.78	2.0639	16 31 16.1	4.409	22	6 13 11.09	2.1990	18 29 31.3	0.345
23	4 32 53.70	2.0667	+16 35 38.4	+1.335	23	6 15 23.11	2.2016	+18 29 49.2	+0.250
SEPTEMBER 3.					SEPTEMBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 34 57.79	2.0696	+16 39 56.3	+1.261	0	6 17 35.28	2.2041	+18 30 1.3	+0.154
1	4 37 2.05	2.0721	16 44 9.7	4.187	1	6 19 47.60	2.2067	18 30 7.7	+0.059
2	4 39 6.48	2.0752	16 48 18.7	4.112	2	6 22 0.08	2.2092	18 30 8.4	-0.037
3	4 41 11.08	2.0781	16 52 23.1	4.036	3	6 24 12.70	2.2117	18 30 3.3	0.133
4	4 43 15.85	2.0809	16 56 23.0	3.960	4	6 26 25.48	2.2142	18 29 52.4	0.230
5	4 45 20.79	2.0838	17 0 18.3	3.883	5	6 28 38.40	2.2166	18 29 35.7	0.327
6	4 47 25.91	2.0867	17 4 9.0	3.806	6	6 30 51.47	2.2190	18 29 13.1	0.424
7	4 49 31.19	2.0895	17 7 55.0	3.728	7	6 33 4.68	2.2213	18 28 44.8	0.522
8	4 51 36.65	2.0924	17 11 36.4	3.650	8	6 35 18.03	2.2237	18 28 10.5	0.620
9	4 53 42.28	2.0953	17 15 13.0	3.572	9	6 37 31.53	2.2261	18 27 30.4	0.718
10	4 55 48.09	2.0982	17 18 45.0	3.493	10	6 39 45.16	2.2284	18 26 44.4	0.816
11	4 57 54.07	2.1011	17 22 12.2	3.413	11	6 41 58.94	2.2307	18 25 52.5	0.915
12	5 0 0.22	2.1040	17 25 34.6	3.333	12	6 44 12.85	2.2330	18 24 54.6	1.014
13	5 2 6.55	2.1069	17 28 52.2	3.253	13	6 46 26.90	2.2353	18 23 50.8	1.113
14	5 4 13.05	2.1097	17 32 4.9	3.172	14	6 48 41.08	2.2375	18 22 41.0	1.213
15	5 6 19.72	2.1126	17 35 12.8	3.091	15	6 50 55.40	2.2397	18 21 25.3	1.312
16	5 8 26.56	2.1155	17 38 15.8	3.009	16	6 53 9.84	2.2418	18 20 3.6	1.412
17	5 10 33.58	2.1185	17 41 13.9	2.927	17	6 55 24.42	2.2440	18 18 35.9	1.512
18	5 12 40.78	2.1213	17 44 7.0	2.843	18	6 57 39.12	2.2461	18 17 2.2	1.613
19	5 14 48.14	2.1242	17 46 55.1	2.759	19	6 59 53.95	2.2482	18 15 22.4	1.713
20	5 16 55.68	2.1271	17 49 38.1	2.676	20	7 2 8.91	2.2503	18 13 36.6	1.813
21	5 19 3.39	2.1300	17 52 16.2	2.592	21	7 4 23.98	2.2523	18 11 44.8	1.913
22	5 21 11.28	2.1329	17 54 49.2	2.508	22	7 6 39.18	2.2543	18 9 47.0	2.015
23	5 23 19.34	2.1358	17 57 17.1	2.422	23	7 8 54.50	2.2563	18 7 43.0	2.117
24	5 25 27.57	2.1386	+17 59 39.8	+2.336	24	7 11 9.93	2.2582	+18 5 33.0	-2.215

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 6.					SEPTEMBER 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 11 9.93	2.2582	+18 5 33.0	-2.218	0	9 1 13.24	2.3160	+14 22 27.9	-7.015
1	7 13 25.48	2.2602	18 3 16.9	2.318	1	9 3 32.22	2.3165	14 15 24.2	7.108
2	7 15 41.15	2.2621	18 0 54.8	2.420	2	9 5 51.22	2.3170	14 8 14.9	7.202
3	7 17 56.93	2.2639	17 58 26.5	2.522	3	9 8 10.26	2.3175	14 1 0.0	7.293
4	7 20 12.82	2.2657	17 55 52.1	2.624	4	9 10 29.32	2.3179	13 53 39.7	7.385
5	7 22 28.81	2.2675	17 53 11.6	2.726	5	9 12 48.41	2.3184	13 46 13.8	7.477
6	7 24 44.92	2.2693	17 50 25.0	2.828	6	9 15 7.53	2.3188	13 38 42.5	7.566
7	7 27 1.13	2.2710	17 47 32.2	2.930	7	9 17 26.67	2.3192	13 31 5.9	7.655
8	7 29 17.44	2.2727	17 44 33.4	3.032	8	9 19 45.83	2.3195	13 23 23.9	7.745
9	7 31 33.85	2.2743	17 41 28.4	3.134	9	9 22 5.01	2.3199	13 15 36.5	7.834
10	7 33 50.36	2.2760	17 38 17.3	3.236	10	9 24 24.22	2.3203	13 7 43.8	7.922
11	7 36 6.97	2.2777	17 35 0.1	3.338	11	9 26 43.45	2.3206	12 59 45.9	8.009
12	7 38 23.68	2.2793	17 31 36.7	3.441	12	9 29 2.69	2.3208	12 51 42.7	8.096
13	7 40 40.48	2.2808	17 28 7.2	3.543	13	9 31 21.95	2.3212	12 43 34.4	8.182
14	7 42 57.37	2.2823	17 24 31.6	3.644	14	9 33 41.23	2.3214	12 35 20.9	8.267
15	7 45 14.35	2.2837	17 20 49.9	3.747	15	9 36 0.52	2.3217	12 27 2.4	8.351
16	7 47 31.41	2.2852	17 17 2.0	3.850	16	9 38 19.83	2.3220	12 18 38.8	8.435
17	7 49 48.57	2.2867	17 13 7.9	3.952	17	9 40 39.16	2.3222	12 10 10.2	8.518
18	7 52 5.81	2.2880	17 9 7.8	4.053	18	9 42 58.49	2.3223	12 1 36.6	8.600
19	7 54 23.13	2.2893	17 5 1.6	4.155	19	9 45 17.84	2.3227	11 52 58.2	8.682
20	7 56 40.53	2.2907	17 0 49.2	4.257	20	9 47 37.21	2.3228	11 44 14.8	8.763
21	7 58 58.01	2.2920	16 56 30.7	4.358	21	9 49 56.58	2.3229	11 35 26.6	8.842
22	8 1 15.57	2.2933	16 52 6.2	4.460	22	9 52 15.96	2.3231	11 26 33.7	8.921
23	8 3 33.20	2.2945	+16 47 35.5	-4.502	23	9 54 35.35	2.3233	+11 17 36.1	-9.009
SEPTEMBER 7.					SEPTEMBER 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	8 5 50.91	2.2957	+16 42 58.8	-4.663	0	9 56 54.75	2.3234	+11 8 33.7	-9.078
1	8 8 8.69	2.2968	16 38 16.0	4.764	1	9 59 14.16	2.3236	10 59 26.7	9.154
2	8 10 26.53	2.2980	16 33 27.1	4.865	2	10 1 33.58	2.3237	10 50 15.2	9.230
3	8 12 44.45	2.2992	16 28 32.2	4.966	3	10 3 53.01	2.3238	10 40 59.1	9.305
4	8 15 2.43	2.3002	16 23 31.2	5.067	4	10 6 12.44	2.3239	10 31 38.6	9.378
5	8 17 20.47	2.3013	16 18 24.2	5.168	5	10 8 31.88	2.3240	10 22 13.7	9.452
6	8 19 38.68	2.3023	16 13 11.1	5.268	6	10 10 51.32	2.3241	10 12 44.4	9.524
7	8 21 56.75	2.3033	16 7 52.1	5.367	7	10 13 10.77	2.3242	10 3 10.8	9.595
8	8 24 14.98	2.3043	16 2 27.1	5.467	8	10 15 30.23	2.3243	9 53 33.0	9.665
9	8 26 33.26	2.3052	15 56 56.1	5.566	9	10 17 49.69	2.3244	9 43 51.0	9.734
10	8 28 51.60	2.3061	15 51 19.2	5.665	10	10 20 9.16	2.3245	9 34 4.9	9.803
11	8 31 9.99	2.3070	15 45 36.3	5.764	11	10 22 28.63	2.3246	9 24 14.7	9.870
12	8 33 28.44	2.3079	15 39 47.5	5.862	12	10 24 48.11	2.3247	9 14 20.5	9.937
13	8 35 46.94	2.3087	15 33 52.8	5.960	13	10 27 7.59	2.3247	9 4 22.3	10.002
14	8 38 5.48	2.3094	15 27 52.3	6.058	14	10 29 27.07	2.3248	8 54 20.3	10.065
15	8 40 24.07	2.3102	15 21 45.8	6.157	15	10 31 46.56	2.3249	8 44 14.5	10.128
16	8 42 42.71	2.3110	15 15 33.5	6.253	16	10 34 6.06	2.3250	8 34 4.9	10.192
17	8 45 1.39	2.3117	15 9 15.4	6.350	17	10 36 25.56	2.3250	8 23 51.5	10.253
18	8 47 20.11	2.3123	15 2 51.5	6.447	18	10 38 45.06	2.3251	8 13 34.6	10.312
19	8 49 38.87	2.3130	14 56 21.8	6.543	19	10 41 4.57	2.3252	8 3 14.1	10.371
20	8 51 57.67	2.3137	14 49 46.4	6.638	20	10 43 24.09	2.3253	7 52 50.1	10.428
21	8 54 16.51	2.3143	14 43 5.3	6.733	21	10 45 43.60	2.3253	7 42 22.7	10.485
22	8 56 35.39	2.3149	14 36 18.5	6.828	22	10 48 3.13	2.3255	7 31 51.9	10.541
23	8 58 54.30	2.3154	14 29 26.0	6.922	23	10 50 22.66	2.3255	7 21 17.8	10.595
24	9 1 13.24	2.3160	+14 22 27.9	-7.015	24	10 52 42.19	2.3256	+ 7 10 40.5	-10.648

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 10.					SEPTEMBER 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 52 42.19	2.3256	+7 10 40.5	-10.648	0	12 44 38.72	2.3442	-1 57 55.8	-11.696
1	10 55 1.73	2.3257	7 0 0.0	10.701	1	12 46 59.39	2.3450	2 9 37.2	11.683
2	10 57 21.28	2.3259	6 49 16.4	10.752	2	12 49 20.12	2.3458	2 21 17.8	11.670
3	10 59 40.84	2.3260	6 38 29.8	10.802	3	12 51 40.89	2.3466	2 32 57.6	11.656
4	11 2 0.40	2.3261	6 27 40.2	10.850	4	12 54 1.71	2.3474	2 44 36.5	11.640
5	11 4 19.97	2.3262	6 16 47.8	10.897	5	12 56 22.58	2.3483	2 56 14.4	11.622
6	11 6 39.55	2.3264	6 5 52.5	10.943	6	12 58 43.51	2.3492	3 7 51.2	11.603
7	11 8 59.14	2.3265	5 54 54.6	10.988	7	13 1 4.49	2.3501	3 19 26.8	11.583
8	11 11 18.73	2.3267	5 43 53.9	11.032	8	13 3 25.52	2.3510	3 31 1.1	11.561
9	11 13 38.34	2.3268	5 32 50.7	11.075	9	13 5 46.61	2.3519	3 42 34.1	11.538
10	11 15 57.95	2.3270	5 21 44.9	11.116	10	13 8 7.75	2.3528	3 54 5.7	11.514
11	11 18 17.58	2.3272	5 10 36.8	11.156	11	13 10 28.95	2.3537	4 5 35.8	11.488
12	11 20 37.22	2.3274	4 59 26.2	11.195	12	13 12 50.20	2.3547	4 17 4.3	11.461
13	11 22 56.87	2.3276	4 48 13.4	11.232	13	13 15 11.51	2.3557	4 28 31.1	11.432
14	11 25 16.53	2.3278	4 36 58.3	11.268	14	13 17 32.89	2.3568	4 39 56.1	11.402
15	11 27 36.21	2.3281	4 25 41.2	11.303	15	13 19 54.32	2.3578	4 51 19.3	11.371
16	11 29 55.90	2.3283	4 14 22.0	11.337	16	13 22 15.82	2.3588	5 2 40.6	11.338
17	11 32 15.60	2.3285	4 3 0.8	11.369	17	13 24 37.37	2.3598	5 13 59.9	11.303
18	11 34 35.32	2.3288	3 51 37.7	11.400	18	13 26 58.99	2.3609	5 25 17.0	11.268
19	11 36 55.06	2.3291	3 40 12.8	11.430	19	13 29 20.68	2.3620	5 36 32.0	11.232
20	11 39 14.81	2.3293	3 28 46.1	11.458	20	13 31 42.43	2.3630	5 47 44.8	11.193
21	11 41 34.58	2.3297	3 17 17.8	11.485	21	13 34 4.24	2.3641	5 58 55.2	11.153
22	11 43 54.37	2.3300	3 5 47.9	11.511	22	13 36 26.12	2.3653	6 10 3.2	11.112
23	11 46 14.18	2.3303	+2 54 16.5	-11.535	23	13 38 48.07	2.3664	-6 21 8.7	-11.070
SEPTEMBER 11.					SEPTEMBER 13.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 48 34.01	2.3307	+2 42 43.7	-11.558	0	13 41 10.09	2.3675	-6 32 11.6	-11.027
1	11 50 53.86	2.3311	2 31 9.5	11.580	1	13 43 32.17	2.3687	6 43 11.9	10.982
2	11 53 13.74	2.3314	2 19 34.1	11.600	2	13 45 54.33	2.3698	6 54 9.4	10.935
3	11 55 33.63	2.3318	2 7 57.5	11.619	3	13 48 16.55	2.3709	7 5 4.1	10.888
4	11 57 53.56	2.3323	1 56 19.8	11.637	4	13 50 38.84	2.3721	7 15 56.0	10.840
5	12 0 13.51	2.3327	1 44 41.1	11.653	5	13 53 1.20	2.3733	7 26 44.9	10.789
6	12 2 33.48	2.3331	1 33 1.5	11.668	6	13 55 23.63	2.3745	7 37 30.7	10.737
7	12 4 53.48	2.3336	1 21 21.0	11.681	7	13 57 46.14	2.3757	7 48 13.4	10.685
8	12 7 13.51	2.3342	1 9 39.8	11.693	8	14 0 8.71	2.3768	7 58 52.9	10.632
9	12 9 33.58	2.3347	0 57 57.8	11.704	9	14 2 31.36	2.3781	8 9 29.2	10.576
10	12 11 53.67	2.3351	0 46 15.3	11.713	10	14 4 54.08	2.3793	8 20 2.0	10.519
11	12 14 13.79	2.3356	0 34 32.3	11.721	11	14 7 16.88	2.3806	8 30 31.5	10.462
12	12 16 33.94	2.3362	0 22 48.8	11.728	12	14 9 39.75	2.3818	8 40 57.4	10.403
13	12 18 54.13	2.3367	+0 11 5.0	11.733	13	14 12 2.69	2.3830	8 51 19.8	10.343
14	12 21 14.35	2.3373	-0 0 39.1	11.737	14	14 14 25.71	2.3842	9 1 38.5	10.281
15	12 23 34.61	2.3379	0 12 23.4	11.738	15	14 16 48.80	2.3854	9 11 53.5	10.218
16	12 25 54.90	2.3385	0 24 7.7	11.739	16	14 19 11.96	2.3867	9 22 4.7	10.154
17	12 28 15.23	2.3392	0 35 52.1	11.739	17	14 21 35.20	2.3879	9 32 12.0	10.089
18	12 30 35.61	2.3399	0 47 36.4	11.737	18	14 23 58.51	2.3892	9 42 15.4	10.023
19	12 32 56.02	2.3405	0 59 20.5	11.733	19	14 26 21.90	2.3904	9 52 14.8	9.956
20	12 35 16.47	2.3412	1 11 4.4	11.728	20	14 28 45.36	2.3917	10 2 10.1	9.887
21	12 37 36.97	2.3420	1 22 47.9	11.722	21	14 31 8.90	2.3929	10 12 1.2	9.817
22	12 39 57.51	2.3427	1 34 31.1	11.715	22	14 33 32.51	2.3941	10 21 48.1	9.747
23	12 42 18.09	2.3434	1 46 13.7	11.706	23	14 35 56.19	2.3953	10 31 30.8	9.675
24	12 44 38.72	2.3442	-1 57 55.8	-11.696	24	14 38 19.95	2.3966	-10 41 9.1	-9.602

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 14.					SEPTEMBER 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	14 38 19.95	2.3966	-10 41 9.1	-9.602	0	16 34 30.69	2.4348	-16 39 39.3	-5.037
1	14 40 43.78	2.3978	10 50 43.0	9.528	1	16 36 56.78	2.4348	16 44 38.2	4.926
2	14 43 7.68	2.3990	11 0 12.4	9.453	2	16 39 22.87	2.4348	16 49 30.4	4.814
3	14 45 31.66	2.4003	11 9 37.3	9.376	3	16 41 48.96	2.4348	16 54 15.9	4.702
4	14 47 55.71	2.4015	11 18 57.5	9.298	4	16 44 15.04	2.4347	16 58 54.7	4.590
5	14 50 19.84	2.4027	11 28 13.0	9.219	5	16 46 41.12	2.4346	17 3 26.7	4.478
6	14 52 44.03	2.4038	11 37 23.8	9.141	6	16 49 7.19	2.4343	17 7 52.0	4.365
7	14 55 8.29	2.4050	11 46 29.9	9.060	7	16 51 33.24	2.4341	17 12 10.5	4.252
8	14 57 32.63	2.4062	11 55 31.0	8.978	8	16 53 59.28	2.4338	17 16 22.2	4.138
9	14 59 57.03	2.4073	12 4 27.2	8.895	9	16 56 25.30	2.4335	17 20 27.1	4.025
10	15 2 21.51	2.4085	12 13 18.4	8.812	10	16 58 51.30	2.4332	17 24 25.2	3.911
11	15 4 46.05	2.4096	12 22 4.6	8.728	11	17 1 17.28	2.4328	17 28 16.4	3.797
12	15 7 10.66	2.4107	12 30 45.7	8.642	12	17 3 43.23	2.4323	17 32 0.8	3.683
13	15 9 35.33	2.4118	12 39 21.6	8.555	13	17 6 9.15	2.4318	17 35 38.3	3.568
14	15 12 0.08	2.4129	12 47 52.3	8.467	14	17 8 35.04	2.4313	17 39 8.9	3.453
15	15 14 24.88	2.4139	12 56 17.7	8.378	15	17 11 0.90	2.4306	17 42 32.7	3.338
16	15 16 49.75	2.4150	13 4 37.7	8.289	16	17 13 26.71	2.4299	17 45 49.5	3.223
17	15 19 14.68	2.4161	13 12 52.4	8.200	17	17 15 52.49	2.4292	17 48 59.4	3.108
18	15 21 39.68	2.4171	13 21 1.7	8.108	18	17 18 18.22	2.4284	17 52 2.4	2.993
19	15 24 4.73	2.4181	13 29 5.4	8.016	19	17 20 43.90	2.4277	17 54 58.5	2.878
20	15 26 29.85	2.4191	13 37 3.6	7.923	20	17 23 9.54	2.4268	17 57 47.7	2.762
21	15 28 55.02	2.4200	13 44 56.2	7.830	21	17 25 35.12	2.4258	18 0 29.9	2.646
22	15 31 20.25	2.4209	13 52 43.2	7.736	22	17 28 0.64	2.4249	18 3 5.2	2.531
23	15 33 45.53	2.4218	-14 0 24.5	-7.640	23	17 30 26.11	2.4239	-18 5 33.6	-2.415
SEPTEMBER 15.					SEPTEMBER 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 36 10.87	2.4227	-14 8 0.0	-7.543	0	17 32 51.51	2.4228	-18 7 55.0	-2.299
1	15 38 36.26	2.4236	14 15 29.7	7.447	1	17 35 16.85	2.4217	18 10 9.5	2.184
2	15 41 1.70	2.4244	14 22 53.7	7.350	2	17 37 42.12	2.4205	18 12 17.1	2.068
3	15 43 27.19	2.4253	14 30 11.7	7.250	3	17 40 7.31	2.4193	18 14 17.7	1.952
4	15 45 52.73	2.4261	14 37 23.7	7.151	4	17 42 32.43	2.4181	18 16 11.3	1.837
5	15 48 18.32	2.4268	14 44 29.8	7.052	5	17 44 57.48	2.4168	18 17 58.1	1.722
6	15 50 43.95	2.4276	14 51 29.9	6.951	6	17 47 22.45	2.4154	18 19 37.9	1.606
7	15 53 9.63	2.4282	14 58 23.9	6.849	7	17 49 47.33	2.4139	18 21 10.8	1.491
8	15 55 35.34	2.4288	15 5 11.8	6.747	8	17 52 12.12	2.4125	18 22 36.8	1.376
9	15 58 1.09	2.4295	15 11 53.6	6.646	9	17 54 36.83	2.4110	18 23 55.9	1.260
10	16 0 26.88	2.4301	15 18 29.3	6.543	10	17 57 1.44	2.4094	18 25 8.0	1.145
11	16 2 52.70	2.4307	15 24 58.7	6.438	11	17 59 25.96	2.4078	18 26 13.3	1.031
12	16 5 18.57	2.4313	15 31 21.8	6.333	12	18 1 50.38	2.4062	18 27 11.7	0.916
13	16 7 44.46	2.4318	15 37 38.7	6.228	13	18 4 14.70	2.4044	18 28 3.2	0.801
14	16 10 10.38	2.4323	15 43 49.2	6.122	14	18 6 38.91	2.4027	18 28 47.8	0.687
15	16 12 36.33	2.4327	15 49 53.3	6.016	15	18 9 3.02	2.4009	18 29 25.6	0.573
16	16 15 2.30	2.4330	15 55 51.1	5.909	16	18 11 27.02	2.3990	18 29 56.5	0.458
17	16 17 28.29	2.4334	16 1 42.4	5.802	17	18 13 50.90	2.3971	18 30 20.6	0.345
18	16 19 54.31	2.4337	16 7 27.3	5.694	18	18 16 14.67	2.3952	18 30 37.9	0.232
19	16 22 20.34	2.4340	16 13 5.7	5.586	19	18 18 38.32	2.3931	18 30 48.5	0.119
20	16 24 46.39	2.4342	16 18 37.6	5.477	20	18 21 1.84	2.3911	18 30 52.2	-0.006
21	16 27 12.45	2.4344	16 24 2.9	5.367	21	18 23 25.25	2.3890	18 30 49.2	+0.107
22	16 29 38.52	2.4346	16 29 21.6	5.258	22	18 25 48.52	2.3868	18 30 39.4	0.219
23	16 32 4.60	2.4347	16 34 33.8	5.148	23	18 28 11.67	2.3847	18 30 22.9	0.331
24	16 34 30.69	2.4348	-16 39 39.3	-5.037	24	18 30 34.68	2.3823	-18 29 59.7	+0.442

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 18.					SEPTEMBER 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	18 30 34.68	2.3823	-18 29 59.7	+0.442	0	20 21 37.85	2.2338	-16 9 12.6	+5.197
1	18 32 57.55	2.3801	18 29 29.8	0.553	1	20 23 51.77	2.2302	16 3 58.3	5.280
2	18 35 20.29	2.3778	18 28 53.3	0.664	2	20 26 5.47	2.2265	15 58 39.0	5.362
3	18 37 42.89	2.3754	18 28 10.1	0.776	3	20 28 18.95	2.2228	15 53 14.8	5.444
4	18 40 5.34	2.3729	18 27 20.2	0.886	4	20 30 32.21	2.2192	15 47 45.7	5.525
5	18 42 27.64	2.3705	18 26 23.8	0.994	5	20 32 45.25	2.2156	15 42 11.8	5.605
6	18 44 49.80	2.3680	18 25 20.9	1.104	6	20 34 58.08	2.2119	15 36 33.1	5.684
7	18 47 11.80	2.3655	18 24 11.3	1.211	7	20 37 10.68	2.2083	15 30 49.7	5.763
8	18 49 33.66	2.3629	18 22 55.2	1.322	8	20 39 23.07	2.2046	15 25 1.5	5.841
9	18 51 55.35	2.3602	18 21 32.7	1.430	9	20 41 35.23	2.2008	15 19 8.8	5.918
10	18 54 16.89	2.3576	18 20 3.6	1.537	10	20 43 47.17	2.1972	15 13 11.4	5.993
11	18 56 38.26	2.3548	18 18 28.2	1.644	11	20 45 58.90	2.1936	15 7 9.6	6.068
12	18 58 59.47	2.3521	18 16 46.3	1.752	12	20 48 10.40	2.1898	15 1 3.2	6.144
13	19 1 20.51	2.3493	18 14 58.0	1.858	13	20 50 21.68	2.1862	14 54 52.3	6.218
14	19 3 41.39	2.3465	18 13 3.4	1.963	14	20 52 32.75	2.1826	14 48 37.1	6.290
15	19 6 2.09	2.3437	18 11 2.5	2.068	15	20 54 43.59	2.1788	14 42 17.5	6.363
16	19 8 22.63	2.3408	18 8 55.2	2.173	16	20 56 54.21	2.1752	14 35 53.5	6.435
17	19 10 42.98	2.3378	18 6 41.7	2.277	17	20 59 4.62	2.1716	14 29 25.3	6.505
18	19 13 3.16	2.3349	18 4 22.0	2.380	18	21 1 14.80	2.1679	14 22 52.9	6.574
19	19 15 23.17	2.3319	18 1 56.1	2.483	19	21 3 24.77	2.1643	14 16 16.4	6.643
20	19 17 42.99	2.3288	17 59 24.0	2.586	20	21 5 34.52	2.1607	14 9 35.7	6.712
21	19 20 2.63	2.3257	17 56 45.8	2.688	21	21 7 44.05	2.1570	14 2 50.9	6.779
22	19 22 22.08	2.3226	17 54 1.5	2.789	22	21 9 53.36	2.1533	13 56 2.2	6.846
23	19 24 41.34	2.3195	-17 51 11.1	+2.890	23	21 12 2.45	2.1497	-13 49 9.4	+6.912
SEPTEMBER 19.					SEPTEMBER 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 27 0.42	2.3163	-17 48 14.7	+2.990	0	21 14 11.33	2.1462	-13 42 12.7	+6.978
1	19 29 19.30	2.3132	17 45 12.3	3.090	1	21 16 19.99	2.1426	13 35 12.1	7.042
2	19 31 38.00	2.3100	17 42 3.9	3.189	2	21 18 28.44	2.1390	13 28 7.7	7.105
3	19 33 56.50	2.3067	17 38 49.6	3.287	3	21 20 36.67	2.1354	13 20 59.5	7.167
4	19 36 14.81	2.3034	17 35 29.5	3.384	4	21 22 44.69	2.1318	13 13 47.6	7.229
5	19 38 32.91	2.3001	17 32 3.5	3.482	5	21 24 52.49	2.1283	13 6 32.0	7.291
6	19 40 50.82	2.2968	17 28 31.7	3.578	6	21 27 0.08	2.1248	12 59 12.7	7.351
7	19 43 8.53	2.2935	17 24 54.1	3.673	7	21 29 7.46	2.1213	12 51 49.9	7.410
8	19 45 26.04	2.2902	17 21 10.9	3.768	8	21 31 14.63	2.1178	12 44 23.5	7.469
9	19 47 43.35	2.2868	17 17 21.9	3.863	9	21 33 21.59	2.1143	12 36 53.6	7.527
10	19 50 0.45	2.2833	17 13 27.3	3.957	10	21 35 28.34	2.1108	12 29 20.3	7.583
11	19 52 17.35	2.2799	17 9 27.0	4.051	11	21 37 34.88	2.1073	12 21 43.6	7.640
12	19 54 34.04	2.2764	17 5 21.2	4.143	12	21 39 41.21	2.1038	12 14 3.5	7.696
13	19 56 50.52	2.2730	17 1 9.9	4.234	13	21 41 47.34	2.1004	12 6 20.1	7.750
14	19 59 6.80	2.2695	16 56 53.1	4.326	14	21 43 53.26	2.0970	11 58 33.5	7.803
15	20 1 22.86	2.2660	16 52 30.8	4.417	15	21 45 58.98	2.0936	11 50 43.7	7.857
16	20 3 38.72	2.2625	16 48 3.1	4.506	16	21 48 4.49	2.0902	11 42 50.7	7.909
17	20 5 54.36	2.2589	16 43 30.1	4.594	17	21 50 9.81	2.0869	11 34 54.6	7.960
18	20 8 9.79	2.2553	16 38 51.8	4.683	18	21 52 14.92	2.0835	11 26 55.5	8.011
19	20 10 25.00	2.2518	16 34 8.2	4.771	19	21 54 19.83	2.0802	11 18 53.3	8.062
20	20 12 40.01	2.2482	16 29 19.3	4.858	20	21 56 24.55	2.0770	11 10 48.1	8.110
21	20 14 54.79	2.2446	16 24 25.3	4.943	21	21 58 29.07	2.0738	11 2 40.1	8.158
22	20 17 9.36	2.2410	16 19 26.2	5.028	22	22 0 33.40	2.0705	10 54 29.1	8.206
23	20 19 23.71	2.2374	16 14 21.9	5.113	23	22 2 37.53	2.0673	10 46 15.4	8.252
24	20 21 37.85	2.2338	-16 9 12.6	+5.197	24	22 4 41.47	2.0641	-10 37 58.9	+8.298

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 22.					SEPTEMBER 24.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 4 41.47	2.0641	-10 37 58.9	+8.298	0	23 40 36.49	1.9445	-3 21 39.5	+9.593
1	22 6 45.22	2.0608	10 29 39.7	8.343	1	23 42 33.11	1.9428	3 12 3.6	9.602
2	22 8 48.77	2.0577	10 21 17.7	8.387	2	23 44 29.63	1.9412	3 2 27.2	9.611
3	22 10 52.14	2.0547	10 12 53.2	8.430	3	23 46 26.05	1.9395	2 52 50.3	9.618
4	22 12 55.33	2.0515	10 4 26.1	8.473	4	23 48 22.37	1.9379	2 43 13.0	9.626
5	22 14 58.32	2.0484	9 55 56.4	8.515	5	23 50 18.60	1.9364	2 33 35.2	9.633
6	22 17 1.14	2.0454	9 47 24.3	8.558	6	23 52 14.74	1.9349	2 23 57.1	9.638
7	22 19 3.77	2.0423	9 38 49.7	8.597	7	23 54 10.79	1.9335	2 14 18.7	9.642
8	22 21 6.22	2.0393	9 30 12.7	8.636	8	23 56 6.76	1.9320	2 4 40.1	9.647
9	22 23 8.49	2.0363	9 21 33.4	8.674	9	23 58 2.63	1.9306	1 55 1.1	9.651
10	22 25 10.58	2.0334	9 12 51.8	8.712	10	23 59 58.43	1.9293	1 45 22.0	9.653
11	22 27 12.50	2.0305	9 4 7.9	8.750	11	0 1 54.15	1.9279	1 35 42.8	9.655
12	22 29 14.24	2.0276	8 55 21.8	8.786	12	0 3 49.78	1.9266	1 26 3.4	9.657
13	22 31 15.81	2.0247	8 46 33.6	8.822	13	0 5 45.34	1.9253	1 16 24.0	9.658
14	22 33 17.21	2.0219	8 37 43.2	8.857	14	0 7 40.82	1.9241	1 6 44.5	9.658
15	22 35 18.44	2.0192	8 28 50.8	8.890	15	0 9 36.23	1.9230	0 57 5.1	9.658
16	22 37 19.51	2.0164	8 19 56.4	8.923	16	0 11 31.58	1.9218	0 47 25.6	9.657
17	22 39 20.41	2.0136	8 11 0.0	8.956	17	0 13 26.85	1.9207	0 37 46.3	9.654
18	22 41 21.14	2.0109	8 2 1.7	8.988	18	0 15 22.06	1.9197	0 28 7.1	9.652
19	22 43 21.72	2.0082	7 53 1.5	9.019	19	0 17 17.21	1.9186	0 18 28.0	9.650
20	22 45 22.13	2.0056	7 43 59.4	9.049	20	0 19 12.29	1.9176	-0 8 49.1	9.646
21	22 47 22.39	2.0030	7 34 55.6	9.078	21	0 21 7.32	1.9167	+0 0 49.5	9.641
22	22 49 22.49	2.0003	7 25 50.0	9.107	22	0 23 2.29	1.9157	0 10 27.8	9.636
23	22 51 22.43	1.9977	- 7 16 42.7	+9.135	23	0 24 57.20	1.9148	+0 20 5.8	+9.630
SEPTEMBER 23.					SEPTEMBER 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 53 22.22	1.9952	- 7 7 33.8	+9.162	0	0 26 52.06	1.9139	+0 29 43.4	+9.624
1	22 55 21.86	1.9927	6 58 23.3	9.188	1	0 28 46.87	1.9131	0 39 20.7	9.617
2	22 57 21.35	1.9903	6 49 11.2	9.214	2	0 30 41.63	1.9123	0 48 57.5	9.609
3	22 59 20.70	1.9879	6 39 57.6	9.239	3	0 32 36.35	1.9116	0 58 33.8	9.601
4	23 1 19.90	1.9854	6 30 42.5	9.263	4	0 34 31.02	1.9108	1 8 9.6	9.592
5	23 3 18.95	1.9831	6 21 26.0	9.287	5	0 36 25.65	1.9102	1 17 44.9	9.583
6	23 5 17.87	1.9807	6 12 8.1	9.309	6	0 38 20.24	1.9095	1 27 19.6	9.573
7	23 7 16.64	1.9784	6 2 48.9	9.331	7	0 40 14.79	1.9088	1 36 53.7	9.562
8	23 9 15.28	1.9762	5 53 28.4	9.352	8	0 42 9.30	1.9083	1 46 27.1	9.551
9	23 11 13.78	1.9739	5 44 6.6	9.373	9	0 44 3.79	1.9078	1 55 59.8	9.538
10	23 13 12.15	1.9717	5 34 43.6	9.393	10	0 45 58.24	1.9073	2 5 31.7	9.526
11	23 15 10.39	1.9696	5 25 19.5	9.412	11	0 47 52.66	1.9068	2 15 2.9	9.513
12	23 17 8.50	1.9674	5 15 54.2	9.430	12	0 49 47.05	1.9063	2 24 33.3	9.500
13	23 19 6.48	1.9653	5 6 27.9	9.448	13	0 51 41.41	1.9059	2 34 2.9	9.485
14	23 21 4.34	1.9633	4 57 0.5	9.465	14	0 53 35.76	1.9057	2 43 31.5	9.470
15	23 23 2.07	1.9613	4 47 32.1	9.481	15	0 55 30.09	1.9053	2 52 59.3	9.454
16	23 24 59.69	1.9593	4 38 2.8	9.496	16	0 57 24.39	1.9049	3 2 26.0	9.438
17	23 26 57.18	1.9573	4 28 32.6	9.511	17	0 59 18.68	1.9047	3 11 51.8	9.422
18	23 28 54.56	1.9553	4 19 1.5	9.524	18	1 1 12.95	1.9045	3 21 16.6	9.404
19	23 30 51.82	1.9534	4 9 29.7	9.538	19	1 3 7.22	1.9043	3 30 40.3	9.386
20	23 32 48.97	1.9516	3 59 57.0	9.551	20	1 5 1.47	1.9041	3 40 2.9	9.367
21	23 34 46.01	1.9498	3 50 23.6	9.563	21	1 6 55.71	1.9040	3 49 24.3	9.348
22	23 36 42.94	1.9480	3 40 49.5	9.573	22	1 8 49.95	1.9039	3 58 44.6	9.328
23	23 38 39.77	1.9462	3 31 14.8	9.583	23	1 10 44.18	1.9038	4 8 3.7	9.308
24	23 40 36.49	1.9445	- 3 21 39.5	+9.593	24	1 12 38.41	1.9038	+4 17 21.6	+9.287

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 26.					SEPTEMBER 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 12 38.41	1.9038	+ 4 17 21.6	+9 287	0	2 44 37.02	1.9401	+11 8 10.4	+7.621
1	1 14 32.64	1.9038	4 26 38.2	9.265	1	2 46 33.47	1.9416	11 15 46.2	7.573
2	1 16 26.87	1.9039	4 35 53.4	9.243	2	2 48 30.01	1.9431	11 23 19.2	7.525
3	1 18 21.11	1.9040	4 45 7.3	9.220	3	2 50 26.64	1.9446	11 30 49.2	7.476
4	1 20 15.35	1.9041	4 54 19.8	9.197	4	2 52 23.36	1.9461	11 38 16.3	7.427
5	1 22 9.60	1.9042	5 3 30.9	9.173	5	2 54 20.17	1.9476	11 45 40.4	7.377
6	1 24 3.86	1.9044	5 12 40.6	9.149	6	2 56 17.07	1.9492	11 53 1.5	7.327
7	1 25 58.13	1.9047	5 21 48.8	9.123	7	2 58 14.07	1.9508	12 0 19.6	7.276
8	1 27 52.42	1.9049	5 30 55.4	9.097	8	3 0 11.17	1.9524	12 7 34.6	7.224
9	1 29 46.72	1.9052	5 40 0.5	9.072	9	3 2 8.36	1.9540	12 14 46.5	7.173
10	1 31 41.04	1.9056	5 49 4.0	9.045	10	3 4 5.65	1.9557	12 21 55.3	7.121
11	1 33 35.39	1.9059	5 58 5.9	9.017	11	3 6 3.05	1.9574	12 29 1.0	7.068
12	1 35 29.75	1.9063	6 7 6.1	8.989	12	3 8 0.54	1.9591	12 36 3.4	7.013
13	1 37 24.14	1.9067	6 16 4.6	8.961	13	3 9 58.14	1.9608	12 43 2.6	6.960
14	1 39 18.55	1.9071	6 25 1.4	8.932	14	3 11 55.84	1.9626	12 49 58.6	6.906
15	1 41 12.99	1.9075	6 33 56.4	8.903	15	3 13 53.65	1.9643	12 56 51.3	6.851
16	1 43 7.45	1.9080	6 42 49.7	8.873	16	3 15 51.56	1.9661	13 3 40.7	6.795
17	1 45 1.95	1.9087	6 51 41.1	8.842	17	3 17 49.58	1.9679	13 10 26.7	6.739
18	1 46 56.49	1.9092	7 0 30.7	8.810	18	3 19 47.71	1.9698	13 17 9.4	6.683
19	1 48 51.05	1.9098	7 9 18.3	8.778	19	3 21 45.96	1.9717	13 23 48.7	6.627
20	1 50 45.66	1.9105	7 18 4.1	8.747	20	3 23 44.31	1.9734	13 30 24.6	6.569
21	1 52 40.31	1.9111	7 26 47.9	8.713	21	3 25 42.77	1.9753	13 36 57.0	6.512
22	1 54 34.99	1.9118	7 35 29.7	8.679	22	3 27 41.35	1.9772	13 43 26.0	6.453
23	1 56 29.72	1.9126	+ 7 44 9.4	+8.645	23	3 29 40.04	1.9792	+13 49 51.4	+6.394
SEPTEMBER 27.					SEPTEMBER 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 58 24.50	1.9133	+ 7 52 47.1	+8.611	0	3 31 38.85	1.9811	+13 56 13.3	+6.336
1	2 0 19.32	1.9141	8 1 22.7	8.576	1	3 33 37.77	1.9831	14 2 31.7	6.276
2	2 2 14.19	1.9149	8 9 56.2	8.540	2	3 35 36.82	1.9851	14 8 46.4	6.215
3	2 4 9.11	1.9158	8 18 27.5	8.503	3	3 37 35.98	1.9870	14 14 57.5	6.155
4	2 6 4.08	1.9167	8 26 56.6	8.467	4	3 39 35.26	1.9891	14 21 5.0	6.094
5	2 7 59.11	1.9176	8 35 23.5	8.430	5	3 41 34.67	1.9911	14 27 8.8	6.032
6	2 9 54.19	1.9184	8 43 48.2	8.392	6	3 43 34.19	1.9931	14 33 8.8	5.969
7	2 11 49.32	1.9194	8 52 10.5	8.353	7	3 45 33.84	1.9952	14 39 5.1	5.907
8	2 13 44.52	1.9204	9 0 30.6	8.315	8	3 47 33.61	1.9973	14 44 57.7	5.844
9	2 15 39.77	1.9214	9 8 48.3	8.275	9	3 49 33.51	1.9993	14 50 46.4	5.780
10	2 17 35.09	1.9225	9 17 3.6	8.235	10	3 51 33.53	2.0014	14 56 31.3	5.717
11	2 19 30.47	1.9236	9 25 16.5	8.195	11	3 53 33.68	2.0036	15 2 12.4	5.652
12	2 21 25.92	1.9247	9 33 27.0	8.154	12	3 55 33.96	2.0057	15 7 49.5	5.587
13	2 23 21.43	1.9258	9 41 35.0	8.112	13	3 57 34.36	2.0078	15 13 22.8	5.522
14	2 25 17.02	1.9270	9 49 40.4	8.070	14	3 59 34.90	2.0100	15 18 52.1	5.455
15	2 27 12.67	1.9282	9 57 43.4	8.027	15	4 1 35.56	2.0121	15 24 17.4	5.389
16	2 29 8.40	1.9294	10 5 43.7	7.984	16	4 3 36.35	2.0143	15 29 38.8	5.322
17	2 31 4.20	1.9307	10 13 41.5	7.941	17	4 5 37.27	2.0165	15 34 56.1	5.255
18	2 33 0.08	1.9320	10 21 36.6	7.897	18	4 7 38.33	2.0187	15 40 9.4	5.187
19	2 34 56.04	1.9333	10 29 29.1	7.852	19	4 9 39.52	2.0209	15 45 18.6	5.119
20	2 36 52.07	1.9346	10 37 18.9	7.807	20	4 11 40.84	2.0231	15 50 23.7	5.051
21	2 38 48.19	1.9359	10 45 5.9	7.761	21	4 13 42.29	2.0253	15 55 24.7	4.982
22	2 40 44.38	1.9373	10 52 50.2	7.715	22	4 15 43.87	2.0275	16 0 21.5	4.912
23	2 42 40.66	1.9387	11 0 31.7	7.668	23	4 17 45.59	2.0298	16 5 14.1	4.842
24	2 44 37.02	1.9401	+11 8 10.4	+7.621	24	4 19 47.45	2.0321	+16 10 2.5	+4.772

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
SEPTEMBER 30.					OCTOBER 2.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	4 19 47.45	2.0321	16 10 2.5	+1.772	0	5 59 58.97	2.1419	+18 29 45.9	+0.898
1	4 21 49.44	2.0343	16 14 46.7	4.700	1	6 2 7.55	2.1440	18 30 37.1	0.809
2	4 23 51.57	2.0366	16 19 26.5	4.628	2	6 4 16.25	2.1462	18 31 23.0	0.719
3	4 25 53.83	2.0388	16 24 2.1	4.557	3	6 6 25.09	2.1483	18 32 3.4	0.628
4	4 27 56.23	2.0411	16 28 33.4	4.485	4	6 8 34.05	2.1504	18 32 38.4	0.538
5	4 29 58.76	2.0434	16 33 0.3	4.412	5	6 10 43.14	2.1526	18 33 8.0	0.447
6	4 32 1.44	2.0457	16 37 22.9	4.339	6	6 12 52.36	2.1547	18 33 32.1	0.356
7	4 34 4.25	2.0479	16 41 41.0	4.265	7	6 15 1.70	2.1568	18 33 50.7	0.264
8	4 36 7.19	2.0502	16 45 54.7	4.191	8	6 17 11.17	2.1588	18 34 3.8	0.173
9	4 38 10.28	2.0526	16 50 3.9	4.117	9	6 19 20.76	2.1608	18 34 11.4	+0.081
10	4 40 13.50	2.0549	16 54 8.7	4.042	10	6 21 30.47	2.1629	18 34 13.5	-0.012
11	4 42 16.87	2.0572	16 58 9.0	3.967	11	6 23 40.31	2.1650	18 34 10.0	0.104
12	4 44 20.37	2.0595	17 2 4.7	3.891	12	6 25 50.27	2.1670	18 34 1.0	0.197
13	4 46 24.01	2.0618	17 5 55.9	3.814	13	6 28 0.35	2.1690	18 33 46.4	0.290
14	4 48 27.79	2.0642	17 9 42.4	3.737	14	6 30 10.55	2.1710	18 33 26.2	0.383
15	4 50 31.72	2.0666	17 13 24.4	3.661	15	6 32 20.87	2.1730	18 33 0.4	0.477
16	4 52 35.78	2.0688	17 17 1.7	3.583	16	6 34 31.31	2.1749	18 32 29.0	0.571
17	4 54 39.98	2.0712	17 20 34.4	3.506	17	6 36 41.86	2.1768	18 31 51.9	0.665
18	4 56 44.33	2.0736	17 24 2.4	3.428	18	6 38 52.53	2.1788	18 31 9.2	0.759
19	4 58 48.81	2.0758	17 27 25.7	3.349	19	6 41 3.31	2.1807	18 30 20.8	0.854
20	5 0 53.43	2.0782	17 30 44.3	3.270	20	6 43 14.21	2.1826	18 29 26.7	0.948
21	5 2 58.19	2.0805	17 33 58.1	3.190	21	6 45 25.22	2.1844	18 28 27.0	1.043
22	5 5 3.09	2.0829	17 37 7.1	3.110	22	6 47 36.34	2.1863	18 27 21.6	1.138
23	5 7 8.14	2.0852	+17 40 11.3	+3.029	23	6 49 47.57	2.1882	+18 26 10.5	-1.233
OCTOBER 1.					OCTOBER 3.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 9 13.32	2.0875	+17 43 10.6	+2.948	0	6 51 58.92	2.1900	+18 24 53.6	-1.320
1	5 11 18.64	2.0898	17 46 5.1	2.868	1	6 54 10.37	2.1918	18 23 31.0	1.421
2	5 13 24.10	2.0922	17 48 54.7	2.787	2	6 56 21.94	2.1937	18 22 2.7	1.520
3	5 15 29.70	2.0945	17 51 39.5	2.705	3	6 58 33.61	2.1953	18 20 28.6	1.616
4	5 17 35.44	2.0968	17 54 19.3	2.622	4	7 0 45.38	2.1971	18 18 48.8	1.713
5	5 19 41.32	2.0992	17 56 54.1	2.539	5	7 2 57.26	2.1989	18 17 3.1	1.809
6	5 21 47.34	2.1014	17 59 24.0	2.457	6	7 5 9.25	2.2006	18 15 11.7	1.904
7	5 23 53.49	2.1037	18 1 48.9	2.373	7	7 7 21.33	2.2023	18 13 14.6	2.001
8	5 25 59.79	2.1061	18 4 8.7	2.288	8	7 9 33.52	2.2040	18 11 11.6	2.098
9	5 28 6.22	2.1083	18 6 23.5	2.205	9	7 11 45.81	2.2057	18 9 2.8	2.195
10	5 30 12.79	2.1107	18 8 33.3	2.120	10	7 13 58.20	2.2073	18 6 48.2	2.292
11	5 32 19.50	2.1129	18 10 37.9	2.035	11	7 16 10.69	2.2089	18 4 27.8	2.389
12	5 34 26.34	2.1152	18 12 37.5	1.950	12	7 18 23.27	2.2105	18 2 1.5	2.487
13	5 36 33.32	2.1175	18 14 31.9	1.864	13	7 20 35.95	2.2122	17 59 29.4	2.583
14	5 38 40.44	2.1198	18 16 21.2	1.778	14	7 22 48.73	2.2138	17 56 51.5	2.680
15	5 40 47.69	2.1220	18 18 5.3	1.692	15	7 25 1.60	2.2153	17 54 7.8	2.778
16	5 42 55.08	2.1242	18 19 44.2	1.605	16	7 27 14.57	2.2169	17 51 18.2	2.876
17	5 45 2.60	2.1264	18 21 17.9	1.518	17	7 29 27.63	2.2184	17 48 22.7	2.973
18	5 47 10.25	2.1287	18 22 46.3	1.430	18	7 31 40.78	2.2199	17 45 21.4	3.070
19	5 49 18.04	2.1310	18 24 9.5	1.342	19	7 33 54.02	2.2214	17 42 14.3	3.168
20	5 51 25.97	2.1332	18 25 27.4	1.254	20	7 36 7.35	2.2229	17 39 1.3	3.266
21	5 53 34.02	2.1353	18 26 40.0	1.166	21	7 38 20.77	2.2243	17 35 42.4	3.363
22	5 55 42.21	2.1375	18 27 47.3	1.077	22	7 40 34.27	2.2257	17 32 17.7	3.461
23	5 57 50.52	2.1397	18 28 49.3	0.988	23	7 42 47.86	2.2272	17 28 47.1	3.558
24	5 59 58.97	2.1419	+18 29 45.9	+0.898	24	7 45 1.54	2.2287	+17 25 10.7	-3.656

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.
OCTOBER 4.									OCTOBER 6.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	7	45	1.54	2.2287	+17	25	10.7	-3.656	0	9	33	20.49	2.2802	+12	39	39.2	-8.139
1	7	47	15.30	2.2300	17	21	28.4	3.753	1	9	35	37.33	2.2811	12	31	28.3	8.223
2	7	49	29.14	2.2314	17	17	40.3	3.851	2	9	37	54.22	2.2819	12	23	12.4	8.307
3	7	51	43.07	2.2328	17	13	46.3	3.949	3	9	40	11.16	2.2828	12	14	51.5	8.390
4	7	53	57.07	2.2341	17	9	46.4	4.047	4	9	42	28.15	2.2837	12	6	25.6	8.472
5	7	56	11.16	2.2354	17	5	40.7	4.144	5	9	44	45.20	2.2846	11	57	54.8	8.554
6	7	58	25.32	2.2368	17	1	29.1	4.242	6	9	47	2.30	2.2854	11	49	19.1	8.636
7	8	0	39.57	2.2381	16	57	11.7	4.338	7	9	49	19.45	2.2863	11	40	38.5	8.717
8	8	2	53.89	2.2393	16	52	48.5	4.436	8	9	51	36.65	2.2872	11	31	53.1	8.797
9	8	5	8.28	2.2405	16	48	19.4	4.533	9	9	53	53.91	2.2881	11	23	2.9	8.876
10	8	7	22.75	2.2418	16	43	44.5	4.630	10	9	56	11.22	2.2889	11	14	8.0	8.955
11	8	9	37.30	2.2431	16	39	3.8	4.727	11	9	58	28.58	2.2898	11	5	8.3	9.033
12	8	11	51.92	2.2443	16	34	17.2	4.824	12	10	0	45.99	2.2906	10	56	4.0	9.110
13	8	14	6.61	2.2454	16	29	24.9	4.921	13	10	3	8.45	2.2915	10	46	55.1	9.187
14	8	16	21.37	2.2466	16	24	26.7	5.018	14	10	5	20.97	2.2925	10	37	41.6	9.263
15	8	18	36.20	2.2478	16	19	22.7	5.114	15	10	7	38.55	2.2933	10	28	23.5	9.338
16	8	20	51.11	2.2490	16	14	13.0	5.210	16	10	9	56.17	2.2942	10	19	1.0	9.413
17	8	23	6.08	2.2501	16	8	57.5	5.307	17	10	12	13.85	2.2952	10	9	34.0	9.487
18	8	25	21.12	2.2512	16	3	36.2	5.403	18	10	14	31.59	2.2961	10	0	2.6	9.559
19	8	27	36.22	2.2523	15	58	9.2	5.498	19	10	16	49.38	2.2969	9	50	26.9	9.631
20	8	29	51.39	2.2534	15	52	36.4	5.594	20	10	19	7.22	2.2978	9	40	46.9	9.702
21	8	32	6.63	2.2546	15	46	57.9	5.689	21	10	21	25.12	2.2988	9	31	2.7	9.772
22	8	34	21.94	2.2556	15	41	13.7	5.784	22	10	23	43.08	2.2998	9	21	14.2	9.842
23	8	36	37.30	2.2566	+15	35	23.8	-5.879	23	10	26	1.09	2.3007	+9	11	21.7	-9.910
OCTOBER 5.									OCTOBER 7.								
0	8	38	52.73	2.2577	+15	29	28.2	-5.974	0	10	28	19.16	2.3017	+9	1	25.0	-9.978
1	8	41	8.22	2.2587	15	23	26.9	6.068	1	10	30	37.29	2.3026	8	51	24.3	10.016
2	8	43	23.78	2.2597	15	17	20.1	6.162	2	10	32	55.47	2.3035	8	41	19.5	10.112
3	8	45	39.39	2.2607	15	11	7.5	6.257	3	10	35	13.71	2.3045	8	31	10.9	10.176
4	8	47	55.07	2.2617	15	4	49.3	6.349	4	10	37	32.01	2.3056	8	20	58.4	10.240
5	8	50	10.80	2.2627	14	58	25.6	6.442	5	10	39	50.38	2.3066	8	10	42.1	10.333
6	8	52	26.60	2.2637	14	51	56.2	6.536	6	10	42	8.80	2.3075	8	0	22.0	10.385
7	8	54	42.45	2.2647	14	45	21.3	6.628	7	10	44	27.28	2.3086	7	49	58.3	10.426
8	8	56	58.36	2.2657	14	38	40.9	6.720	8	10	46	45.83	2.3097	7	39	30.9	10.486
9	8	59	14.33	2.2667	14	31	54.9	6.812	9	10	49	4.44	2.3107	7	29	0.0	10.545
10	9	1	30.36	2.2676	14	25	3.4	6.903	10	10	51	23.11	2.3117	7	18	25.5	10.603
11	9	3	46.44	2.2685	14	18	6.5	6.994	11	10	53	41.84	2.3128	7	7	47.6	10.660
12	9	6	2.58	2.2695	14	11	4.1	7.085	12	10	56	0.64	2.3138	6	57	6.3	10.717
13	9	8	18.78	2.2704	14	3	56.3	7.176	13	10	58	19.50	2.3149	6	46	21.6	10.772
14	9	10	35.03	2.2713	13	56	43.0	7.266	14	11	0	38.43	2.3161	6	35	33.7	10.826
15	9	12	51.33	2.2722	13	49	24.4	7.355	15	11	2	57.43	2.3172	6	24	42.5	10.878
16	9	15	7.69	2.2732	13	42	0.4	7.444	16	11	5	16.49	2.3183	6	13	48.3	10.930
17	9	17	24.11	2.2740	13	34	31.1	7.533	17	11	7	35.62	2.3195	6	2	50.9	10.981
18	9	19	40.57	2.2748	13	26	56.5	7.621	18	11	9	54.83	2.3207	5	51	50.6	11.030
19	9	21	57.09	2.2758	13	19	16.6	7.708	19	11	12	14.10	2.3218	5	40	47.3	11.079
20	9	24	13.67	2.2767	13	11	31.5	7.796	20	11	14	33.44	2.3230	5	29	41.1	11.126
21	9	26	30.29	2.2775	13	3	41.1	7.883	21	11	16	52.86	2.3242	5	18	32.2	11.172
22	9	28	46.97	2.2785	12	55	45.6	7.968	22	11	19	12.35	2.3254	5	7	20.5	11.217
23	9	31	3.71	2.2793	12	47	45.0	8.053	23	11	21	31.91	2.3267	4	56	6.2	11.260
24	9	33	20.49	2.2802	+12	39	39.2	-8.139	24	11	23	51.55	2.3280	+4	44	49.3	-11.302

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 8.					OCTOBER 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 23 51.55	2.3280	+4 44 49.3	-11.302	0	13 17 22.49	2.4080	-4 41 3.3	-11.718
1	11 26 11.27	2.3293	4 33 29.9	11.343	1	13 19 47.03	2.4101	4 52 45.5	11.689
2	11 28 31.06	2.3305	4 22 8.1	11.384	2	13 22 11.70	2.4121	5 4 26.0	11.660
3	11 30 50.93	2.3318	4 10 43.8	11.423	3	13 24 36.48	2.4141	5 16 4.7	11.629
4	11 33 10.88	2.3332	3 59 17.3	11.460	4	13 27 1.39	2.4162	5 27 41.5	11.596
5	11 35 30.91	2.3345	3 47 48.6	11.497	5	13 29 26.42	2.4182	5 39 16.2	11.561
6	11 37 51.02	2.3358	3 36 17.7	11.532	6	13 31 51.57	2.4202	5 50 48.8	11.525
7	11 40 11.21	2.3372	3 24 44.8	11.564	7	13 34 16.84	2.4222	6 2 19.2	11.487
8	11 42 31.48	2.3386	3 13 10.0	11.597	8	13 36 42.23	2.4243	6 13 47.3	11.448
9	11 44 51.84	2.3400	3 1 33.2	11.628	9	13 39 7.75	2.4263	6 25 13.0	11.408
10	11 47 12.28	2.3414	2 49 54.6	11.658	10	13 41 33.39	2.4283	6 36 36.3	11.366
11	11 49 32.81	2.3429	2 38 14.2	11.687	11	13 43 59.15	2.4304	6 47 56.9	11.322
12	11 51 53.43	2.3444	2 26 32.2	11.713	12	13 46 25.04	2.4325	6 59 14.9	11.277
13	11 54 14.14	2.3458	2 14 48.6	11.739	13	13 48 51.05	2.4346	7 10 30.1	11.230
14	11 56 34.93	2.3473	2 3 3.5	11.763	14	13 51 17.19	2.4367	7 21 42.5	11.182
15	11 58 55.82	2.3489	1 51 17.0	11.787	15	13 53 43.45	2.4387	7 32 51.9	11.131
16	12 1 16.80	2.3504	1 39 29.1	11.808	16	13 56 9.83	2.4407	7 43 58.2	11.079
17	12 3 37.87	2.3519	1 27 40.1	11.828	17	13 58 36.33	2.4427	7 55 1.4	11.027
18	12 5 59.03	2.3535	1 15 49.8	11.847	18	14 1 2.95	2.4448	8 6 1.5	10.973
19	12 8 20.29	2.3551	1 3 58.5	11.864	19	14 3 29.70	2.4468	8 16 58.2	10.917
20	12 10 41.64	2.3567	0 52 6.1	11.880	20	14 5 56.57	2.4488	8 27 51.5	10.859
21	12 13 3.09	2.3583	0 40 12.9	11.894	21	14 8 23.55	2.4508	8 38 41.3	10.801
22	12 15 24.64	2.3600	0 28 18.8	11.907	22	14 10 50.66	2.4528	8 49 27.6	10.741
23	12 17 46.29	2.3617	+0 16 24.0	-11.919	23	14 13 17.89	2.4548	-9 0 10.2	-10.678
OCTOBER 9.					OCTOBER 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 20 8.04	2.3633	+0 4 28.5	-11.929	0	14 15 45.24	2.4568	-9 10 49.0	-10.615
1	12 22 29.89	2.3650	-0 7 27.5	11.938	1	14 18 12.71	2.4588	9 21 24.0	10.551
2	12 24 51.84	2.3668	0 19 24.0	11.945	2	14 20 40.29	2.4607	9 31 55.1	10.485
3	12 27 13.90	2.3685	0 31 20.9	11.951	3	14 23 7.99	2.4627	9 42 22.2	10.417
4	12 29 36.06	2.3703	0 43 18.1	11.954	4	14 25 35.81	2.4647	9 52 45.2	10.348
5	12 31 58.33	2.3720	0 55 15.4	11.957	5	14 28 3.75	2.4666	10 3 4.0	10.278
6	12 34 20.70	2.3737	1 7 12.9	11.958	6	14 30 31.80	2.4684	10 13 18.5	10.206
7	12 36 43.17	2.3755	1 19 10.4	11.958	7	14 32 59.96	2.4703	10 23 28.7	10.133
8	12 39 5.76	2.3773	1 31 7.9	11.957	8	14 35 28.23	2.4722	10 33 34.5	10.058
9	12 41 28.45	2.3792	1 43 5.2	11.953	9	14 37 56.62	2.4740	10 43 35.7	9.982
10	12 43 51.26	2.3810	1 55 2.2	11.948	10	14 40 25.11	2.4758	10 53 32.3	9.905
11	12 46 14.17	2.3828	2 6 58.9	11.942	11	14 42 53.72	2.4777	11 3 24.3	9.827
12	12 48 37.20	2.3847	2 18 55.2	11.934	12	14 45 22.43	2.4794	11 13 11.5	9.747
13	12 51 0.34	2.3866	2 30 51.0	11.924	13	14 47 51.25	2.4812	11 22 53.9	9.666
14	12 53 23.59	2.3884	2 42 46.1	11.913	14	14 50 20.17	2.4829	11 32 31.4	9.583
15	12 55 46.95	2.3903	2 54 40.6	11.901	15	14 52 49.20	2.4846	11 42 3.8	9.498
16	12 58 10.43	2.3923	3 6 34.2	11.886	16	14 55 18.32	2.4863	11 51 31.2	9.414
17	13 0 34.03	2.3943	3 18 26.9	11.871	17	14 57 47.55	2.4879	12 0 53.5	9.328
18	13 2 57.75	2.3962	3 30 18.7	11.854	18	15 0 16.87	2.4895	12 10 10.6	9.240
19	13 5 21.57	2.3981	3 42 9.4	11.835	19	15 2 46.29	2.4911	12 19 22.3	9.152
20	13 7 45.52	2.4002	3 53 58.9	11.814	20	15 5 15.80	2.4927	12 28 28.8	9.062
21	13 10 9.59	2.4021	4 5 47.1	11.792	21	15 7 45.41	2.4942	12 37 29.8	8.971
22	13 12 33.77	2.4040	4 17 34.0	11.769	22	15 10 15.10	2.4957	12 46 25.3	8.878
23	13 14 58.07	2.4060	4 29 19.4	11.744	23	15 12 44.89	2.4972	12 55 15.2	8.785
24	13 17 22.49	2.4080	-4 41 3.3	-11.718	24	15 15 14.76	2.4985	-13 3 59.5	-8.691

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 12.					OCTOBER 14.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 15 14.76	2.4985	-13 3 59.5	-8.691	0	17 15 53.15	2.5058	-17 55 41.1	-3.232
1	15 17 44.71	2.4999	13 12 38.1	8.595	1	17 18 23.46	2.5044	17 58 51.3	3.108
2	15 20 14.75	2.5013	13 21 10.9	8.498	2	17 20 53.68	2.5030	18 1 54.0	2.983
3	15 22 44.87	2.5026	13 29 37.9	8.401	3	17 23 23.82	2.5015	18 4 49.2	2.851
4	15 25 15.06	2.5038	13 37 59.0	8.302	4	17 25 53.86	2.4998	18 7 37.1	2.736
5	15 27 45.33	2.5051	13 46 14.1	8.202	5	17 28 23.80	2.4982	18 10 17.5	2.611
6	15 30 15.67	2.5062	13 54 23.2	8.101	6	17 30 53.65	2.4966	18 12 50.4	2.487
7	15 32 46.07	2.5073	14 2 26.2	7.999	7	17 33 23.39	2.4948	18 15 15.9	2.363
8	15 35 16.55	2.5085	14 10 23.1	7.897	8	17 35 53.02	2.4929	18 17 34.0	2.240
9	15 37 47.09	2.5094	14 18 13.8	7.793	9	17 38 22.54	2.4910	18 19 44.7	2.117
10	15 40 17.68	2.5104	14 25 58.2	7.688	10	17 40 51.94	2.4890	18 21 48.0	1.993
11	15 42 48.34	2.5114	14 33 36.3	7.582	11	17 43 21.22	2.4869	18 23 43.8	1.868
12	15 45 19.05	2.5123	14 41 8.0	7.475	12	17 45 50.37	2.4848	18 25 32.2	1.746
13	15 47 49.81	2.5132	14 48 33.3	7.368	13	17 48 19.40	2.4827	18 27 13.3	1.623
14	15 50 20.63	2.5140	14 55 52.2	7.260	14	17 50 48.29	2.4804	18 28 47.0	1.500
15	15 52 51.49	2.5147	15 3 4.5	7.151	15	17 53 17.05	2.4782	18 30 13.3	1.377
16	15 55 22.39	2.5153	15 10 10.3	7.041	16	17 55 45.67	2.4758	18 31 32.2	1.255
17	15 57 53.33	2.5160	15 17 9.4	6.929	17	17 58 14.14	2.4733	18 32 43.9	1.133
18	16 0 24.31	2.5167	15 24 1.8	6.818	18	18 0 42.47	2.4709	18 33 48.2	1.011
19	16 2 55.33	2.5172	15 30 47.6	6.707	19	18 3 10.65	2.4683	18 34 45.2	0.889
20	16 5 26.37	2.5176	15 37 26.6	6.593	20	18 5 38.67	2.4657	18 35 34.9	0.768
21	16 7 57.44	2.5180	15 43 58.8	6.480	21	18 8 6.53	2.4630	18 36 17.4	0.647
22	16 10 28.53	2.5184	15 50 21.2	6.366	22	18 10 34.23	2.4603	18 36 52.6	0.527
23	16 12 53.65	2.5187	-15 56 42.7	-6.251	23	18 13 1.77	2.4575	-18 37 20.6	-0.407
OCTOBER 13.					OCTOBER 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 15 30.78	2.5189	-16 2 54.3	-6.135	0	18 15 29.13	2.4546	-18 37 41.4	-0.287
1	16 18 1.92	2.5191	16 8 58.9	6.018	1	18 17 56.32	2.4517	18 37 55.0	0.167
2	16 20 33.07	2.5193	16 14 56.5	5.902	2	18 20 23.34	2.4488	18 38 1.5	-0.048
3	16 23 4.23	2.5194	16 20 47.1	5.785	3	18 22 50.18	2.4458	18 38 0.8	+0.071
4	16 25 35.40	2.5194	16 26 30.7	5.667	4	18 25 16.83	2.4427	18 37 53.0	0.188
5	16 28 6.56	2.5193	16 32 7.2	5.548	5	18 27 43.31	2.4397	18 37 38.2	0.306
6	16 30 37.71	2.5191	16 37 36.5	5.429	6	18 30 9.59	2.4364	18 37 16.3	0.423
7	16 33 8.85	2.5190	16 42 58.7	5.311	7	18 32 35.68	2.4332	18 36 47.4	0.540
8	16 35 39.99	2.5188	16 48 13.8	5.191	8	18 35 1.58	2.4299	18 36 11.5	0.656
9	16 38 11.11	2.5184	16 53 21.6	5.070	9	18 37 27.27	2.4266	18 35 28.7	0.772
10	16 40 42.20	2.5180	16 58 22.2	4.949	10	18 39 52.77	2.4232	18 34 38.9	0.888
11	16 43 13.27	2.5176	17 3 15.5	4.828	11	18 42 18.06	2.4198	18 33 42.2	1.002
12	16 45 44.31	2.5170	17 8 1.6	4.707	12	18 44 43.15	2.4164	18 32 38.7	1.116
13	16 48 15.31	2.5165	17 12 40.4	4.586	13	18 47 8.03	2.4128	18 31 28.3	1.229
14	16 50 46.29	2.5160	17 17 11.9	4.463	14	18 49 32.69	2.4092	18 30 11.2	1.342
15	16 53 17.23	2.5152	17 21 36.0	4.340	15	18 51 57.14	2.4057	18 28 47.3	1.454
16	16 55 48.11	2.5143	17 25 52.7	4.218	16	18 54 21.37	2.4021	18 27 16.7	1.567
17	16 58 18.95	2.5136	17 30 2.2	4.096	17	18 56 45.39	2.3984	18 25 39.3	1.678
18	17 0 49.74	2.5127	17 34 4.2	3.973	18	18 59 9.18	2.3946	18 23 55.4	1.788
19	17 3 20.47	2.5117	17 37 58.9	3.850	19	19 1 32.74	2.3908	18 22 4.8	1.898
20	17 5 51.15	2.5107	17 41 46.2	3.727	20	19 3 56.08	2.3871	18 20 7.6	2.007
21	17 8 21.75	2.5095	17 45 26.1	3.603	21	19 6 19.19	2.3833	18 18 3.9	2.116
22	17 10 52.29	2.5084	17 48 58.5	3.478	22	19 8 42.07	2.3794	18 15 53.7	2.223
23	17 13 22.76	2.5072	17 52 23.5	3.355	23	19 11 4.72	2.3755	18 13 37.1	2.331
24	17 15 53.15	2.5058	-17 55 41.1	-3.232	24	19 13 27.13	2.3715	-18 11 14.0	+2.435

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 16.					OCTOBER 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 13 27.13	2.3715	-18 11 14.0	+2.438	0	21 2 22.64	2.1649	-14 26 0.0	+6.637
1	19 15 49.30	2.3676	18 8 44.6	2.543	1	21 4 32.41	2.1607	14 19 19.8	6.703
2	19 18 11.24	2.3636	18 6 8.8	2.649	2	21 6 41.92	2.1564	14 12 35.6	6.770
3	19 20 32.93	2.3594	18 3 26.7	2.753	3	21 8 51.18	2.1522	14 5 47.4	6.836
4	19 22 54.37	2.3554	18 0 38.5	2.856	4	21 11 0.19	2.1481	13 58 55.3	6.901
5	19 25 15.58	2.3513	17 57 44.0	2.960	5	21 13 8.95	2.1439	13 51 59.3	6.965
6	19 27 36.53	2.3472	17 54 43.3	3.062	6	21 15 17.46	2.1398	13 44 59.5	7.028
7	19 29 57.24	2.3431	17 51 36.5	3.163	7	21 17 25.72	2.1356	13 37 56.0	7.090
8	19 32 17.70	2.3389	17 48 23.7	3.263	8	21 19 33.73	2.1315	13 30 48.7	7.152
9	19 34 37.91	2.3347	17 45 4.9	3.364	9	21 21 41.50	2.1275	13 23 37.7	7.213
10	19 36 57.86	2.3304	17 41 40.0	3.463	10	21 23 49.03	2.1235	13 16 23.2	7.272
11	19 39 17.56	2.3262	17 38 9.3	3.562	11	21 25 56.32	2.1194	13 9 5.1	7.332
12	19 41 37.01	2.3220	17 34 32.6	3.660	12	21 28 3.36	2.1153	13 1 43.4	7.390
13	19 43 56.20	2.3177	17 30 50.1	3.756	13	21 30 10.16	2.1114	12 54 18.3	7.447
14	19 46 15.13	2.3134	17 27 1.9	3.852	14	21 32 16.73	2.1075	12 46 49.7	7.504
15	19 48 33.81	2.3092	17 23 7.8	3.948	15	21 34 23.06	2.1036	12 39 17.8	7.560
16	19 50 52.23	2.3048	17 19 8.1	4.043	16	21 36 29.16	2.0997	12 31 42.5	7.615
17	19 53 10.38	2.3004	17 15 2.7	4.137	17	21 38 35.02	2.0958	12 24 4.0	7.669
18	19 55 28.28	2.2961	17 10 51.7	4.230	18	21 40 40.65	2.0920	12 16 22.2	7.723
19	19 57 45.91	2.2917	17 6 35.1	4.322	19	21 42 46.06	2.0882	12 8 37.2	7.776
20	20 0 3.28	2.2873	17 2 13.1	4.413	20	21 44 51.23	2.0843	12 0 49.1	7.828
21	20 2 20.39	2.2830	16 57 45.6	4.503	21	21 46 56.18	2.0807	11 52 57.9	7.879
22	20 4 37.24	2.2786	16 53 12.7	4.593	22	21 49 0.91	2.0770	11 45 3.6	7.929
23	20 6 53.82	2.2742	-16 48 34.4	+4.682	23	21 51 5.42	2.0733	-11 37 6.4	+7.978
OCTOBER 17.					OCTOBER 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 9 10.14	2.2698	-16 43 50.8	+4.771	0	21 53 9.70	2.0695	-11 29 6.2	+8.027
1	20 11 26.19	2.2654	16 39 1.9	4.858	1	21 55 13.76	2.0659	11 21 3.1	8.075
2	20 13 41.99	2.2610	16 34 7.9	4.944	2	21 57 17.61	2.0624	11 12 57.2	8.122
3	20 15 57.51	2.2565	16 29 8.6	5.030	3	21 59 21.25	2.0588	11 4 48.5	8.168
4	20 18 12.77	2.2521	16 24 4.3	5.114	4	22 1 24.66	2.0552	10 56 37.0	8.214
5	20 20 27.76	2.2477	16 18 54.9	5.199	5	22 3 27.87	2.0517	10 48 22.8	8.259
6	20 22 42.49	2.2433	16 13 40.4	5.282	6	22 5 30.87	2.0483	10 40 5.9	8.304
7	20 24 56.96	2.2390	16 8 21.0	5.364	7	22 7 33.67	2.0449	10 31 46.3	8.347
8	20 27 11.17	2.2345	16 2 56.7	5.446	8	22 9 36.26	2.0414	10 23 24.2	8.389
9	20 29 25.10	2.2300	15 57 27.5	5.527	9	22 11 38.64	2.0381	10 14 59.6	8.431
10	20 31 38.77	2.2257	15 51 53.5	5.606	10	22 13 40.83	2.0348	10 6 32.5	8.472
11	20 33 52.18	2.2213	15 46 14.8	5.685	11	22 15 42.82	2.0315	9 58 2.9	8.513
12	20 36 5.32	2.2168	15 40 31.3	5.764	12	22 17 44.61	2.0282	9 49 31.0	8.552
13	20 38 18.20	2.2125	15 34 43.1	5.841	13	22 19 46.21	2.0250	9 40 56.7	8.591
14	20 40 30.82	2.2081	15 28 50.4	5.917	14	22 21 47.61	2.0218	9 32 20.1	8.629
15	20 42 43.17	2.2037	15 22 53.1	5.993	15	22 23 48.83	2.0187	9 23 41.2	8.667
16	20 44 55.26	2.1993	15 16 51.2	6.068	16	22 25 49.86	2.0156	9 15 0.1	8.703
17	20 47 7.09	2.1950	15 10 44.9	6.142	17	22 27 50.70	2.0124	9 6 16.8	8.739
18	20 49 18.66	2.1907	15 4 34.2	6.215	18	22 29 51.35	2.0094	8 57 31.4	8.774
19	20 51 29.97	2.1863	14 58 19.1	6.287	19	22 31 51.83	2.0065	8 48 43.9	8.808
20	20 53 41.02	2.1820	14 51 59.7	6.358	20	22 33 52.13	2.0036	8 39 54.4	8.842
21	20 55 51.81	2.1777	14 45 36.1	6.429	21	22 35 52.26	2.0007	8 31 2.9	8.875
22	20 58 2.34	2.1734	14 39 8.2	6.499	22	22 37 52.21	1.9977	8 22 9.4	8.907
23	21 0 12.62	2.1692	14 32 36.2	6.568	23	22 39 51.98	1.9948	8 13 14.0	8.939
24	21 2 22.64	2.1649	-14 26 0.0	+6.637	24	22 41 51.59	1.9921	-8 4 16.7	+8.970

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 20.					OCTOBER 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	22 41 51.59	1.9921	-8 4 16.7	+8.970	0	0 15 0.08	1.9013	-0 31 19.8	+9.648
1	22 43 51.03	1.9893	7 55 17.6	9.000	1	0 16 54.31	1.9034	0 21 40.9	9.647
2	22 45 50.31	1.9866	7 46 16.7	9.029	2	0 18 48.49	1.9026	0 12 2.2	9.644
3	22 47 49.42	1.9838	7 37 14.1	9.058	3	0 20 42.62	1.9018	-0 2 23.6	9.642
4	22 49 48.37	1.9812	7 28 9.8	9.086	4	0 22 36.71	1.9011	+0 7 14.8	9.638
5	22 51 47.17	1.9787	7 19 3.8	9.113	5	0 24 30.75	1.9004	0 16 53.0	9.634
6	22 53 45.81	1.9760	7 9 56.2	9.140	6	0 26 24.76	1.8997	0 26 30.9	9.628
7	22 55 44.29	1.9735	7 0 47.0	9.166	7	0 28 18.72	1.8991	0 36 8.4	9.623
8	22 57 42.63	1.9711	6 51 36.3	9.190	8	0 30 12.65	1.8986	0 45 45.7	9.618
9	22 59 40.82	1.9686	6 42 24.2	9.215	9	0 32 6.55	1.8980	0 55 22.6	9.611
10	23 1 38.86	1.9661	6 33 10.5	9.239	10	0 34 0.41	1.8975	1 4 59.0	9.603
11	23 3 36.75	1.9637	6 23 55.5	9.262	11	0 35 54.25	1.8971	1 14 35.0	9.596
12	23 5 34.51	1.9615	6 14 39.1	9.284	12	0 37 48.06	1.8967	1 24 10.5	9.588
13	23 7 32.13	1.9592	6 5 21.4	9.307	13	0 39 41.85	1.8962	1 33 45.5	9.578
14	23 9 29.61	1.9568	5 56 2.3	9.328	14	0 41 35.61	1.8958	1 43 19.9	9.568
15	23 11 26.95	1.9547	5 46 42.1	9.347	15	0 43 29.35	1.8955	1 52 53.7	9.558
16	23 13 24.17	1.9526	5 37 20.7	9.367	16	0 45 23.07	1.8952	2 2 26.9	9.547
17	23 15 21.26	1.9504	5 27 58.0	9.387	17	0 47 16.78	1.8950	2 11 59.3	9.535
18	23 17 18.22	1.9483	5 18 34.3	9.404	18	0 49 10.47	1.8948	2 21 31.1	9.523
19	23 19 15.05	1.9463	5 9 9.5	9.422	19	0 51 4.15	1.8947	2 31 2.1	9.510
20	23 21 11.77	1.9443	4 59 43.7	9.439	20	0 52 57.83	1.8945	2 40 32.3	9.497
21	23 23 8.36	1.9423	4 50 16.8	9.455	21	0 54 51.49	1.8943	2 50 1.8	9.483
22	23 25 4.84	1.9403	4 40 49.1	9.470	22	0 56 45.15	1.8943	2 59 30.3	9.468
23	23 27 1.20	1.9384	-4 31 20.4	+9.486	23	0 58 38.81	1.8943	+3 8 58.0	+9.454
OCTOBER 21.					OCTOBER 23.				
0	23 28 57.45	1.9366	-4 21 50.8	+9.500	0	1 0 32.47	1.8943	+3 18 24.8	+9.438
1	23 30 53.59	1.9348	4 12 20.4	9.513	1	1 2 26.13	1.8944	3 27 50.6	9.422
2	23 32 49.62	1.9330	4 2 49.2	9.527	2	1 4 19.80	1.8945	3 37 15.4	9.405
3	23 34 45.55	1.9313	3 53 17.2	9.539	3	1 6 13.47	1.8945	3 46 39.2	9.387
4	23 36 41.37	1.9296	3 43 44.5	9.550	4	1 8 7.14	1.8947	3 56 1.9	9.369
5	23 38 37.10	1.9280	3 34 11.2	9.561	5	1 10 0.83	1.8949	4 5 23.5	9.351
6	23 40 32.73	1.9263	3 24 37.2	9.572	6	1 11 54.53	1.8951	4 14 44.0	9.332
7	23 42 28.26	1.9247	3 15 2.6	9.581	7	1 13 48.24	1.8953	4 24 3.3	9.311
8	23 44 23.70	1.9232	3 5 27.5	9.590	8	1 15 41.97	1.8957	4 33 21.3	9.291
9	23 46 19.05	1.9217	2 55 51.8	9.599	9	1 17 35.72	1.8960	4 42 38.2	9.270
10	23 48 14.31	1.9203	2 46 15.6	9.607	10	1 19 29.49	1.8963	4 51 53.7	9.248
11	23 50 9.49	1.9189	2 36 39.0	9.613	11	1 21 23.28	1.8967	5 1 7.9	9.226
12	23 52 4.58	1.9175	2 27 2.0	9.620	12	1 23 17.09	1.8971	5 10 20.8	9.203
13	23 53 59.59	1.9162	2 17 24.6	9.626	13	1 25 10.93	1.8975	5 19 32.3	9.179
14	23 55 54.52	1.9149	2 7 46.9	9.631	14	1 27 4.79	1.8980	5 28 42.3	9.155
15	23 57 49.38	1.9137	1 58 8.9	9.636	15	1 28 58.69	1.8986	5 37 50.9	9.131
16	23 59 44.17	1.9125	1 48 30.6	9.640	16	1 30 52.62	1.8991	5 46 58.0	9.106
17	0 1 38.88	1.9113	1 38 52.1	9.643	17	1 32 46.58	1.8997	5 56 3.6	9.080
18	0 3 33.52	1.9102	1 29 13.5	9.645	18	1 34 40.58	1.9002	6 5 7.6	9.053
19	0 5 28.10	1.9092	1 19 34.7	9.648	19	1 36 34.61	1.9008	6 14 10.0	9.027
20	0 7 22.62	1.9081	1 9 55.7	9.650	20	1 38 28.68	1.9016	6 23 10.8	8.999
21	0 9 17.07	1.9070	1 0 16.7	9.650	21	1 40 22.80	1.9023	6 32 9.9	8.971
22	0 11 11.46	1.9061	0 50 37.7	9.650	22	1 42 16.95	1.9029	6 41 7.3	8.942
23	0 13 5.80	1.9052	0 40 58.7	9.649	23	1 44 11.15	1.9037	6 50 2.9	8.913
24	0 15 0.08	1.9043	-0 31 19.8	+9.648	24	1 46 5.40	1.9046	+6 58 56.8	+8.883

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 24.					OCTOBER 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	1 46 5.40	1.9046	+ 6 58 56.8	+8.883	0	3 18 54.64	1.9713	+13 20 9.9	+6.788
1	1 47 59.70	1.9053	7 7 48.9	8.853	1	3 20 52.97	1.9732	13 26 55.5	6.731
2	1 49 54.04	1.9062	7 16 39.1	8.822	2	3 22 51.42	1.9751	13 33 37.6	6.673
3	1 51 48.44	1.9071	7 25 27.5	8.790	3	3 24 49.98	1.9769	13 40 16.3	6.615
4	1 53 42.89	1.9080	7 34 13.9	8.758	4	3 26 48.65	1.9788	13 46 51.4	6.557
5	1 55 37.40	1.9089	7 42 58.4	8.725	5	3 28 47.43	1.9807	13 53 23.1	6.498
6	1 57 31.96	1.9099	7 51 40.9	8.692	6	3 30 46.33	1.9827	13 59 51.1	6.438
7	1 59 26.59	1.9109	8 0 21.5	8.658	7	3 32 45.35	1.9845	14 6 15.6	6.378
8	2 1 21.27	1.9118	8 8 59.9	8.623	8	3 34 44.47	1.9864	14 12 36.5	6.318
9	2 3 16.01	1.9129	8 17 36.3	8.589	9	3 36 43.72	1.9884	14 18 53.7	6.256
10	2 5 10.82	1.9141	8 26 10.6	8.553	10	3 38 43.08	1.9903	14 25 7.2	6.194
11	2 7 5.70	1.9152	8 34 42.7	8.517	11	3 40 42.56	1.9922	14 31 17.0	6.132
12	2 9 0.64	1.9163	8 43 12.6	8.480	12	3 42 42.15	1.9942	14 37 23.1	6.070
13	2 10 55.65	1.9174	8 51 40.3	8.443	13	3 44 41.86	1.9962	14 43 25.4	6.007
14	2 12 50.73	1.9186	9 0 5.7	8.405	14	3 46 41.69	1.9982	14 49 23.9	5.943
15	2 14 45.88	1.9198	9 8 28.9	8.367	15	3 48 41.64	2.0002	14 55 18.6	5.879
16	2 16 41.10	1.9210	9 16 49.7	8.328	16	3 50 41.71	2.0022	15 1 9.4	5.814
17	2 18 36.40	1.9222	9 25 8.2	8.288	17	3 52 41.90	2.0042	15 6 56.3	5.749
18	2 20 31.77	1.9235	9 33 24.3	8.248	18	3 54 42.21	2.0062	15 12 39.3	5.684
19	2 22 27.22	1.9248	9 41 38.0	8.207	19	3 56 42.64	2.0082	15 18 18.4	5.618
20	2 24 22.75	1.9262	9 49 49.2	8.166	20	3 58 43.19	2.0101	15 23 53.5	5.551
21	2 26 18.36	1.9275	9 57 57.9	8.123	21	4 0 43.85	2.0121	15 29 24.5	5.483
22	2 28 14.05	1.9288	10 6 4.0	8.081	22	4 2 44.64	2.0142	15 34 51.5	5.417
23	2 30 9.82	1.9302	+10 14 7.6	+8.039	23	4 4 45.55	2.0162	+15 40 14.5	+5.349
OCTOBER 25.					OCTOBER 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 32 5.68	1.9317	+10 22 8.7	+7.996	0	4 6 46.58	2.0152	+15 45 33.4	+5.281
1	2 34 1.62	1.9331	10 30 7.1	7.952	1	4 8 47.73	2.0203	15 50 48.2	5.212
2	2 35 57.65	1.9346	10 38 2.9	7.907	2	4 10 49.01	2.0223	15 55 58.8	5.143
3	2 37 53.77	1.9361	10 45 55.9	7.862	3	4 12 50.40	2.0243	16 1 5.3	5.073
4	2 39 49.98	1.9376	10 53 46.3	7.817	4	4 14 51.92	2.0263	16 6 7.5	5.002
5	2 41 46.28	1.9391	11 1 33.9	7.769	5	4 16 53.56	2.0283	16 11 5.5	4.932
6	2 43 42.67	1.9406	11 9 18.6	7.722	6	4 18 55.32	2.0303	16 15 59.3	4.861
7	2 45 39.15	1.9422	11 17 0.6	7.676	7	4 20 57.20	2.0323	16 20 48.8	4.789
8	2 47 35.73	1.9438	11 24 39.7	7.628	8	4 22 59.20	2.0344	16 25 34.0	4.717
9	2 49 32.41	1.9453	11 32 15.9	7.578	9	4 25 1.33	2.0364	16 30 14.8	4.644
10	2 51 29.17	1.9469	11 39 49.1	7.530	10	4 27 3.57	2.0384	16 34 51.3	4.572
11	2 53 26.04	1.9487	11 47 19.5	7.481	11	4 29 5.94	2.0405	16 39 23.4	4.498
12	2 55 23.01	1.9503	11 54 46.8	7.430	12	4 31 8.43	2.0425	16 43 51.1	4.425
13	2 57 20.07	1.9519	12 2 11.1	7.380	13	4 33 11.04	2.0445	16 48 14.4	4.350
14	2 59 17.24	1.9536	12 9 32.4	7.328	14	4 35 13.77	2.0465	16 52 33.1	4.275
15	3 1 14.50	1.9553	12 16 50.5	7.277	15	4 37 16.62	2.0485	16 56 47.4	4.201
16	3 3 11.87	1.9571	12 24 5.6	7.225	16	4 39 19.59	2.0505	17 0 57.2	4.125
17	3 5 9.35	1.9588	12 31 17.5	7.172	17	4 41 22.68	2.0525	17 5 2.4	4.049
18	3 7 6.93	1.9605	12 38 26.2	7.118	18	4 43 25.89	2.0545	17 9 3.1	3.972
19	3 9 4.61	1.9623	12 45 31.7	7.065	19	4 45 29.22	2.0565	17 12 59.1	3.895
20	3 11 2.40	1.9641	12 52 34.0	7.011	20	4 47 32.67	2.0585	17 16 50.5	3.818
21	3 13 0.30	1.9658	12 59 33.0	6.955	21	4 49 36.24	2.0604	17 20 37.3	3.742
22	3 14 58.30	1.9676	13 6 28.6	6.899	22	4 51 39.92	2.0624	17 24 19.5	3.663
23	3 16 56.41	1.9695	13 13 20.9	6.844	23	4 53 43.73	2.0644	17 27 56.9	3.585
24	3 18 54.64	1.9713	+13 20 9.9	+6.788	24	4 55 47.65	2.0663	+17 31 29.7	+3.507

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
OCTOBER 28.					OCTOBER 30.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	4 55 47.65	2.0663	+17 31 29.7	+3.507	0	6 37 0.70	2.1454	+18 42 49.3	-0.638
1	4 57 51.69	2.0683	17 34 57.7	3.428	1	6 39 9.46	2.1467	18 42 8.3	0.730
2	4 59 55.84	2.0702	17 38 21.0	3.348	2	6 41 18.30	2.1479	18 41 21.7	0.822
3	5 2 0.11	2.0722	17 41 39.5	3.268	3	6 43 27.21	2.1491	18 40 29.6	0.914
4	5 4 4.50	2.0741	17 44 53.1	3.187	4	6 45 36.19	2.1503	18 39 32.0	1.007
5	5 6 9.00	2.0760	17 48 1.9	3.107	5	6 47 45.25	2.1515	18 38 28.8	1.099
6	5 8 13.62	2.0779	17 51 5.9	3.026	6	6 49 54.37	2.1527	18 37 20.1	1.192
7	5 10 18.35	2.0798	17 54 5.0	2.945	7	6 52 3.57	2.1538	18 36 5.8	1.284
8	5 12 23.19	2.0817	17 56 59.3	2.863	8	6 54 12.83	2.1550	18 34 46.0	1.377
9	5 14 28.15	2.0836	17 59 48.6	2.781	9	6 56 22.17	2.1561	18 33 20.6	1.469
10	5 16 33.22	2.0854	18 2 33.0	2.698	10	6 58 31.56	2.1571	18 31 49.7	1.562
11	5 18 38.40	2.0873	18 5 12.4	2.616	11	7 0 41.02	2.1582	18 30 13.1	1.656
12	5 20 43.69	2.0891	18 7 46.9	2.533	12	7 2 50.55	2.1593	18 28 31.0	1.748
13	5 22 49.09	2.0909	18 10 16.4	2.450	13	7 5 0.14	2.1603	18 26 43.3	1.842
14	5 24 54.60	2.0928	18 12 40.9	2.366	14	7 7 9.79	2.1613	18 24 50.0	1.934
15	5 27 0.22	2.0946	18 15 0.3	2.282	15	7 9 19.50	2.1624	18 22 51.2	2.028
16	5 29 5.95	2.0963	18 17 14.7	2.198	16	7 11 29.28	2.1634	18 20 46.7	2.122
17	5 31 11.78	2.0981	18 19 24.0	2.113	17	7 13 39.11	2.1643	18 18 36.6	2.214
18	5 33 17.72	2.0999	18 21 28.3	2.028	18	7 15 49.00	2.1653	18 16 21.0	2.308
19	5 35 23.77	2.1017	18 23 27.4	1.943	19	7 17 58.95	2.1663	18 13 59.7	2.401
20	5 37 29.92	2.1033	18 25 21.4	1.858	20	7 20 8.95	2.1672	18 11 32.9	2.493
21	5 39 36.17	2.1051	18 27 10.3	1.772	21	7 22 19.01	2.1681	18 9 0.5	2.587
22	5 41 42.53	2.1068	18 28 54.0	1.685	22	7 24 29.12	2.1690	18 6 22.4	2.681
23	5 43 48.98	2.1084	+18 30 32.5	+1.599	23	7 26 39.29	2.1699	+18 3 38.8	-2.773
OCTOBER 29.					OCTOBER 31.				
0	5 45 55.54	2.1102	+18 32 5.9	+1.512	0	7 28 49.51	2.1708	+18 0 49.6	-2.867
1	5 48 2.20	2.1118	18 33 34.0	1.425	1	7 30 59.78	2.1716	17 57 54.7	2.961
2	5 50 8.95	2.1134	18 34 56.9	1.338	2	7 33 10.10	2.1725	17 54 54.3	3.053
3	5 52 15.81	2.1151	18 36 14.6	1.251	3	7 35 20.48	2.1733	17 51 48.3	3.147
4	5 54 22.76	2.1167	18 37 27.0	1.163	4	7 37 30.90	2.1741	17 48 36.7	3.240
5	5 56 29.81	2.1183	18 38 34.1	1.074	5	7 39 41.37	2.1749	17 45 19.5	3.333
6	5 58 36.95	2.1198	18 39 35.9	0.986	6	7 41 51.89	2.1757	17 41 56.7	3.426
7	6 0 44.19	2.1214	18 40 32.4	0.898	7	7 44 2.46	2.1765	17 38 28.4	3.518
8	6 2 51.52	2.1229	18 41 23.6	0.809	8	7 46 13.07	2.1773	17 34 54.5	3.612
9	6 4 58.94	2.1245	18 42 9.5	0.720	9	7 48 23.73	2.1780	17 31 15.0	3.705
10	6 7 6.46	2.1260	18 42 50.0	0.631	10	7 50 34.43	2.1788	17 27 29.9	3.798
11	6 9 14.06	2.1275	18 43 25.2	0.542	11	7 52 45.18	2.1795	17 23 39.2	3.891
12	6 11 21.76	2.1290	18 43 55.0	0.452	12	7 54 55.97	2.1802	17 19 43.0	3.983
13	6 13 29.54	2.1304	18 44 19.4	0.362	13	7 57 6.80	2.1809	17 15 41.2	4.076
14	6 15 37.41	2.1319	18 44 38.4	0.272	14	7 59 17.68	2.1817	17 11 33.9	4.168
15	6 17 45.37	2.1333	18 44 52.0	0.182	15	8 1 28.60	2.1823	17 7 21.1	4.260
16	6 19 53.41	2.1348	18 45 0.2	0.092	16	8 3 39.56	2.1830	17 3 2.7	4.353
17	6 22 1.54	2.1362	18 45 3.0	+0.001	17	8 5 50.56	2.1837	16 58 38.7	4.445
18	6 24 9.75	2.1375	18 45 0.3	-0.091	18	8 8 1.60	2.1843	16 54 9.3	4.536
19	6 26 18.04	2.1389	18 44 52.1	0.182	19	8 10 12.68	2.1849	16 49 34.4	4.628
20	6 28 26.42	2.1402	18 44 38.5	0.272	20	8 12 23.79	2.1856	16 44 53.9	4.720
21	6 30 34.87	2.1415	18 44 19.5	0.363	21	8 14 34.95	2.1863	16 40 8.0	4.811
22	6 32 43.40	2.1428	18 43 54.9	0.455	22	8 16 46.15	2.1869	16 35 16.6	4.902
23	6 34 52.01	2.1442	18 43 24.9	0.547	23	8 18 57.38	2.1875	16 30 19.7	4.993
24	6 37 0.70	2.1454	+18 42 49.3	-0.638	24	8 21 8.65	2.1882	+16 25 17.4	-5.084

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination.	Var. per Min.				
NOVEMBER 1.							NOVEMBER 3.										
	h	m	s	s	°	'	"		h	m	s	s	°	'	"	"	
0	8	21	8.65	2.1882	+16	25	17.4	-5.084	0	10	6	53.82	2.2207	+10	41	55.3	-9.073
1	8	23	19.96	2.1888	16	20	9.6	5.175	1	10	9	7.09	2.2217	10	32	48.8	9.144
2	8	25	31.30	2.1893	16	14	56.4	5.266	2	10	11	20.43	2.2227	10	23	38.0	9.215
3	8	27	42.68	2.1900	16	9	37.7	5.358	3	10	13	33.82	2.2237	10	14	23.0	9.285
4	8	29	54.10	2.1907	16	4	13.7	5.446	4	10	15	47.27	2.2247	10	5	3.8	9.355
5	8	32	5.56	2.1913	15	58	44.2	5.537	5	10	18	0.78	2.2257	9	55	40.4	9.421
6	8	34	17.05	2.1918	15	53	9.3	5.626	6	10	20	14.36	2.2268	9	46	12.9	9.492
7	8	36	28.57	2.1923	15	47	29.1	5.715	7	10	22	28.00	2.2278	9	36	41.3	9.560
8	8	38	40.13	2.1930	15	41	43.5	5.804	8	10	24	41.70	2.2289	9	27	5.7	9.627
9	8	40	51.73	2.1936	15	35	52.6	5.893	9	10	26	55.47	2.2301	9	17	26.1	9.693
10	8	43	3.36	2.1942	15	29	56.3	5.982	10	10	29	9.31	2.2312	9	7	42.6	9.758
11	8	45	15.03	2.1948	15	23	54.8	6.070	11	10	31	23.22	2.2324	8	57	55.1	9.823
12	8	47	26.73	2.1953	15	17	47.9	6.159	12	10	33	37.20	2.2336	8	48	3.8	9.887
13	8	49	38.47	2.1959	15	11	35.7	6.247	13	10	35	51.25	2.2348	8	38	8.7	9.951
14	8	51	50.24	2.1965	15	5	18.3	6.333	14	10	38	5.37	2.2360	8	28	9.7	10.013
15	8	54	2.05	2.1971	14	58	55.7	6.421	15	10	40	19.57	2.2373	8	18	7.1	10.075
16	8	56	13.89	2.1977	14	52	27.8	6.508	16	10	42	33.85	2.2386	8	8	0.7	10.137
17	8	58	25.77	2.1983	14	45	54.7	6.595	17	10	44	48.20	2.2399	7	57	50.7	10.196
18	9	0	37.68	2.1988	14	39	16.4	6.681	18	10	47	2.64	2.2412	7	47	37.2	10.255
19	9	2	49.63	2.1995	14	32	33.0	6.767	19	10	49	17.15	2.2426	7	37	20.1	10.314
20	9	5	1.62	2.2001	14	25	44.4	6.852	20	10	51	31.75	2.2440	7	26	59.5	10.372
21	9	7	13.64	2.2007	14	18	50.8	6.937	21	10	53	46.43	2.2454	7	16	35.5	10.428
22	9	9	25.70	2.2013	14	11	52.0	7.022	22	10	56	1.20	2.2469	7	6	8.1	10.485
23	9	11	37.79	2.2019	+14	4	48.1	-7.107	23	10	58	16.06	2.2484	+ 6	55	37.3	-10.540
NOVEMBER 2.							NOVEMBER 4.										
0	9	13	49.93	2.2026	+13	57	39.2	-7.191	0	11	0	31.01	2.2499	+ 6	45	3.3	-10.533
1	9	16	2.10	2.2032	13	50	25.2	7.274	1	11	2	46.05	2.2514	6	34	26.1	10.647
2	9	18	14.31	2.2038	13	43	6.3	7.358	2	11	5	1.18	2.2530	6	23	45.6	10.700
3	9	20	26.56	2.2044	13	35	42.3	7.441	3	11	7	16.41	2.2546	6	13	2.1	10.751
4	9	22	38.84	2.2051	13	28	13.4	7.523	4	11	9	31.73	2.2562	-6	2	15.5	10.802
5	9	24	51.17	2.2058	13	20	39.5	7.606	5	11	11	47.15	2.2578	5	51	25.8	10.852
6	9	27	3.53	2.2064	13	13	0.7	7.687	6	11	14	2.67	2.2596	5	40	33.3	10.900
7	9	29	15.94	2.2072	13	5	17.1	7.768	7	11	16	18.30	2.2613	5	29	37.8	10.948
8	9	31	28.39	2.2078	12	57	28.5	7.849	8	11	18	34.03	2.2630	5	18	39.5	10.995
9	9	33	40.88	2.2085	12	49	35.2	7.929	9	11	20	49.86	2.2648	5	7	38.4	11.041
10	9	35	53.41	2.2092	12	41	37.0	8.009	10	11	23	5.80	2.2666	4	56	34.6	11.085
11	9	38	5.99	2.2100	12	33	34.1	8.088	11	11	25	21.85	2.2684	4	45	28.2	11.129
12	9	40	18.61	2.2107	12	25	26.4	8.167	12	11	27	38.01	2.2703	4	34	19.1	11.172
13	9	42	31.27	2.2114	12	17	14.0	8.246	13	11	29	54.29	2.2722	4	23	7.5	11.214
14	9	44	43.98	2.2122	12	8	56.9	8.323	14	11	32	10.68	2.2741	4	11	53.4	11.251
15	9	46	56.74	2.2131	12	0	35.2	8.401	15	11	34	27.18	2.2761	4	0	37.0	11.283
16	9	49	9.55	2.2138	11	52	8.8	8.478	16	11	36	43.81	2.2782	3	49	18.2	11.332
17	9	51	22.40	2.2147	11	43	37.8	8.554	17	11	39	0.56	2.2801	3	37	57.1	11.380
18	9	53	35.31	2.2155	11	35	2.3	8.630	18	11	41	17.42	2.2821	3	26	33.9	11.405
19	9	55	48.26	2.2163	11	26	22.2	8.705	19	11	43	34.41	2.2843	3	15	8.5	11.441
20	9	58	1.27	2.2172	11	17	37.7	8.779	20	11	45	51.53	2.2864	3	3	41.0	11.475
21	10	0	14.33	2.2181	11	8	48.7	8.853	21	11	48	8.78	2.2886	2	52	11.5	11.507
22	10	2	27.44	2.2189	10	59	55.3	8.927	22	11	50	26.16	2.2908	2	40	40.1	11.538
23	10	4	40.60	2.2198	10	50	57.5	9.000	23	11	52	43.67	2.2929	2	29	6.9	11.569
24	10	6	53.82	2.2207	+10	41	55.3	-9.073	24	11	55	1.31	2.2952	+ 2	17	31.8	-11.599

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 5.					NOVEMBER 7.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	11 55 1.31	2.2952	+2 17 31.8	-11.599	0	13 48 20.23	2.4353	-7 7 34.0	-11.385
1	11 57 19.09	2.2975	2 5 55.0	11.627	1	13 50 46.45	2.4387	7 18 55.9	11.343
2	11 59 37.01	2.2998	1 54 16.6	11.653	2	13 53 12.87	2.4421	7 30 15.2	11.300
3	12 1 55.06	2.3021	1 42 36.6	11.679	3	13 55 39.50	2.4455	7 41 31.9	11.255
4	12 4 13.26	2.3046	1 30 55.1	11.704	4	13 58 6.33	2.4488	7 52 45.8	11.208
5	12 6 31.61	2.3069	1 19 12.1	11.727	5	14 0 33.36	2.4522	8 3 56.8	11.159
6	12 8 50.09	2.3093	1 7 27.8	11.748	6	14 3 0.59	2.4556	8 15 4.9	11.110
7	12 11 8.73	2.3119	0 55 42.3	11.769	7	14 5 28.03	2.4590	8 26 10.0	11.058
8	12 13 27.52	2.3143	0 43 55.5	11.789	8	14 7 55.67	2.4623	8 37 11.9	11.004
9	12 15 46.45	2.3168	0 32 7.6	11.807	9	14 10 23.50	2.4656	8 48 10.5	10.949
10	12 18 5.54	2.3194	0 20 18.7	11.823	10	14 12 51.54	2.4690	8 59 5.8	10.893
11	12 20 24.78	2.3220	+0 8 28.8	11.839	11	14 15 19.78	2.4723	9 9 57.7	10.836
12	12 22 44.18	2.3247	-0 3 22.0	11.853	12	14 17 48.22	2.4757	9 20 46.1	10.776
13	12 25 3.74	2.3273	0 15 13.6	11.866	13	14 20 16.86	2.4790	9 31 30.8	10.714
14	12 27 23.46	2.3300	0 27 5.9	11.877	14	14 22 45.70	2.4823	9 42 11.8	10.652
15	12 29 43.34	2.3327	0 38 58.9	11.888	15	14 25 14.73	2.4856	9 52 49.0	10.587
16	12 32 3.39	2.3355	0 50 52.4	11.896	16	14 27 43.97	2.4889	10 3 22.2	10.521
17	12 34 23.60	2.3382	1 2 46.4	11.903	17	14 30 13.40	2.4921	10 13 51.5	10.453
18	12 36 43.97	2.3410	1 14 40.7	11.908	18	14 32 43.02	2.4953	10 24 16.6	10.383
19	12 39 4.52	2.3438	1 26 35.4	11.913	19	14 35 12.84	2.4986	10 34 37.5	10.313
20	12 41 25.23	2.3467	1 38 30.3	11.917	20	14 37 42.85	2.5018	10 44 54.2	10.241
21	12 43 46.12	2.3497	1 50 25.4	11.918	21	14 40 13.05	2.5050	10 55 6.4	10.167
22	12 46 7.19	2.3525	2 2 20.5	11.918	22	14 42 43.45	2.5082	11 5 14.2	10.092
23	12 48 23.42	2.3554	-2 14 15.5	-11.917	23	14 45 14.03	2.5113	-11 15 17.5	-10.015
NOVEMBER 6.					NOVEMBER 8.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 50 49.84	2.3581	-2 26 10.5	-11.914	0	14 47 44.80	2.5143	-11 25 16.0	-9.936
1	12 53 11.43	2.3613	2 38 5.2	11.909	1	14 50 15.75	2.5174	11 35 9.8	9.856
2	12 55 33.20	2.3644	2 49 59.6	11.904	2	14 52 46.89	2.5205	11 44 58.7	9.774
3	12 57 55.16	2.3674	3 1 53.7	11.897	3	14 55 18.21	2.5234	11 54 42.7	9.692
4	13 0 17.29	2.3704	3 13 47.2	11.888	4	14 57 49.70	2.5263	12 4 21.7	9.608
5	13 2 39.61	2.3736	3 25 40.2	11.877	5	15 0 21.37	2.5294	12 13 55.6	9.521
6	13' 5 2.12	2.3767	3 37 32.5	11.865	6	15 2 53.23	2.5323	12 23 24.2	9.433
7	13 7 24.82	2.3798	3 49 24.0	11.852	7	15 5 25.25	2.5351	12 32 47.6	9.345
8	13 9 47.70	2.3829	4 1 14.7	11.837	8	15 7 57.44	2.5379	12 42 5.6	9.255
9	13 12 10.77	2.3861	4 13 4.5	11.821	9	15 10 29.80	2.5407	12 51 18.2	9.163
10	13 14 34.03	2.3893	4 24 53.2	11.802	10	15 13 2.33	2.5435	13 0 25.2	9.069
11	13 16 57.49	2.3925	4 36 40.7	11.782	11	15 15 35.02	2.5462	13 9 26.5	8.975
12	13 19 21.13	2.3957	4 48 27.1	11.762	12	15 18 7.87	2.5488	13 18 22.2	8.880
13	13 21 44.97	2.3989	5 0 12.2	11.739	13	15 20 40.88	2.5514	13 27 12.1	8.783
14	13 24 9.00	2.4022	5 11 55.8	11.715	14	15 23 14.04	2.5540	13 35 56.1	8.684
15	13 26 33.23	2.4055	5 23 38.0	11.689	15	15 25 47.36	2.5565	13 41 34.2	8.584
16	13 28 57.66	2.4088	5 35 18.5	11.662	16	15 28 20.82	2.5589	13 53 6.2	8.483
17	13 31 22.28	2.4121	5 46 57.4	11.633	17	15 30 54.43	2.5613	14 1 32.1	8.381
18	13 33 47.11	2.4154	5 58 34.5	11.602	18	15 33 28.17	2.5636	14 9 51.9	8.277
19	13 36 12.13	2.4187	6 10 9.7	11.570	19	15 36 2.06	2.5659	14 18 5.3	8.172
20	13 38 37.35	2.4220	6 21 42.9	11.536	20	15 38 36.08	2.5681	14 26 12.5	8.067
21	13 41 2.77	2.4253	6 33 14.0	11.501	21	15 41 10.23	2.5702	14 34 13.3	7.959
22	13 43 28.39	2.4287	6 44 43.0	11.464	22	15 43 44.51	2.5723	14 42 7.6	7.851
23	13 45 54.21	2.4320	6 56 9.7	11.425	23	15 46 18.91	2.5743	14 49 55.4	7.741
24	13 48 20.23	2.4353	-7 7 34.0	-11.385	24	15 48 53.43	2.5763	-14 57 36.5	-7.630

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
• NOVEMBER 9.					NOVEMBER 11.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	15 48 53.43	2.5763	-14 57 36.5	-7.630	0	17 53 16.11	2.5713	-18 41 9.6	-1.511
1	15 51 28.07	2.5782	15 5 11.0	7.518	1	17 55 50.32	2.5630	18 42 36.3	1.378
2	15 54 2.81	2.5800	15 12 38.7	7.405	2	17 58 24.39	2.5665	18 43 55.0	1.216
3	15 56 37.67	2.5818	15 19 59.6	7.291	3	18 0 58.30	2.5639	18 45 5.8	1.114
4	15 59 12.63	2.5834	15 27 13.6	7.176	4	18 3 32.06	2.5612	18 46 8.7	0.982
5	16 1 47.68	2.5850	15 34 20.7	7.061	5	18 6 5.65	2.5586	18 47 3.6	0.850
6	16 4 22.83	2.5866	15 41 20.9	6.943	6	18 8 39.09	2.5558	18 47 50.7	0.719
7	16 6 58.07	2.5881	15 48 13.9	6.825	7	18 11 12.35	2.5528	18 48 29.9	0.588
8	16 9 33.40	2.5894	15 54 59.9	6.707	8	18 13 45.43	2.5498	18 49 1.3	0.458
9	16 12 8.80	2.5907	16 1 38.7	6.588	9	18 16 18.33	2.5468	18 49 24.9	0.328
10	16 14 44.28	2.5919	16 8 10.4	6.467	10	18 18 51.05	2.5437	18 49 40.7	0.198
11	16 17 19.83	2.5931	16 14 34.7	6.344	11	18 21 23.57	2.5403	18 49 48.7	-0.069
12	16 19 55.45	2.5942	16 20 51.7	6.222	12	18 23 55.89	2.5370	18 49 49.0	+0.059
13	16 22 31.13	2.5951	16 27 1.4	6.099	13	18 26 28.01	2.5337	18 49 41.6	0.187
14	16 25 6.86	2.5960	16 33 3.6	5.975	14	18 28 59.93	2.5302	18 49 26.6	0.314
15	16 27 42.65	2.5968	16 38 58.4	5.851	15	18 31 31.63	2.5266	18 49 3.9	0.442
16	16 30 18.48	2.5975	16 44 45.7	5.726	16	18 34 3.12	2.5230	18 48 33.6	0.568
17	16 32 54.35	2.5981	16 50 25.5	5.600	17	18 36 34.39	2.5193	18 47 55.7	0.694
18	16 35 30.25	2.5986	16 55 57.7	5.473	18	18 39 5.43	2.5155	18 47 10.3	0.818
19	16 38 6.18	2.5991	17 1 22.3	5.346	19	18 41 36.25	2.5117	18 46 17.5	0.942
20	16 40 42.14	2.5995	17 6 39.2	5.218	20	18 44 6.83	2.5078	18 45 17.2	1.067
21	16 43 18.12	2.5997	17 11 48.5	5.090	21	18 46 37.18	2.5038	18 44 9.5	1.190
22	16 45 54.11	2.5999	17 16 50.0	4.960	22	18 49 7.28	2.4997	18 42 54.4	1.313
23	16 48 30.11	2.6000	-17 21 43.7	-4.831	23	18 51 37.14	2.4956	-18 41 31.9	+1.435
NOVEMBER 10.					NOVEMBER 12.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 51 6.11	2.6000	-17 26 29.7	-4.702	0	18 54 6.75	2.4914	-18 40 2.2	+1.556
1	16 53 42.11	2.5999	17 31 7.9	4.570	1	18 56 36.11	2.4872	18 38 25.2	1.677
2	16 56 18.10	2.5997	17 35 38.1	4.438	2	18 59 5.21	2.4828	18 36 41.0	1.796
3	16 58 54.07	2.5994	17 40 0.5	4.308	3	19 1 34.05	2.4784	18 34 49.7	1.915
4	17 1 30.03	2.5991	17 44 15.1	4.177	4	19 4 2.62	2.4740	18 32 51.2	2.033
5	17 4 5.96	2.5986	17 48 21.7	4.044	5	19 6 30.93	2.4696	18 30 45.7	2.150
6	17 6 41.86	2.5980	17 52 20.4	3.912	6	19 8 58.97	2.4650	18 28 33.2	2.267
7	17 9 17.72	2.5973	17 56 11.1	3.779	7	19 11 26.73	2.4603	18 26 13.7	2.383
8	17 11 53.54	2.5966	17 59 53.9	3.647	8	19 13 54.21	2.4557	18 23 47.3	2.498
9	17 14 29.31	2.5958	18 3 28.8	3.514	9	19 16 21.42	2.4511	18 21 14.0	2.612
10	17 17 5.03	2.5948	18 6 55.6	3.380	10	19 18 48.34	2.4463	18 18 33.9	2.724
11	17 19 40.68	2.5937	18 10 14.4	3.247	11	19 21 14.98	2.4416	18 15 47.1	2.837
12	17 22 16.27	2.5926	18 13 25.2	3.113	12	19 23 41.33	2.4368	18 12 53.5	2.948
13	17 24 51.79	2.5913	18 16 28.0	2.980	13	19 26 7.39	2.4318	18 9 53.3	3.068
14	17 27 27.23	2.5900	18 19 22.8	2.846	14	19 28 33.15	2.4269	18 6 46.5	3.168
15	17 30 2.59	2.5886	18 22 9.5	2.712	15	19 30 58.62	2.4220	18 3 33.1	3.277
16	17 32 37.86	2.5870	18 24 48.3	2.579	16	19 33 23.79	2.4170	18 0 13.2	3.385
17	17 35 13.03	2.5853	18 27 19.0	2.444	17	19 35 48.66	2.4120	17 56 46.9	3.492
18	17 37 48.10	2.5837	18 29 41.6	2.311	18	19 38 13.23	2.4069	17 53 14.2	3.598
19	17 40 23.07	2.5818	18 31 56.3	2.178	19	19 40 37.49	2.4018	17 49 35.2	3.703
20	17 42 57.92	2.5799	18 34 3.0	2.044	20	19 43 1.45	2.3967	17 45 49.9	3.806
21	17 45 32.66	2.5779	18 36 1.6	1.911	21	19 45 25.10	2.3916	17 41 58.5	3.909
22	17 48 7.27	2.5758	18 37 52.3	1.778	22	19 47 48.44	2.3864	17 38 0.8	4.012
23	17 50 41.76	2.5737	18 39 35.0	1.644	23	19 50 11.47	2.3812	17 33 57.0	4.113
24	17 53 16.11	2.5713	-18 41 9.6	-1.511	24	19 52 34.18	2.3759	-17 29 47.2	+4.213

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 13.					NOVEMBER 15.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	19 52 34.18	2.3759	-17 29 47.2	+4.213	0	21 40 30.35	2.1258	-12 30 56.0	+7.863
1	19 54 56.58	2.3707	17 25 31.4	4.312	1	21 42 37.76	2.1212	12 23 2.6	7.916
2	19 57 18.67	2.3655	17 21 9.7	4.411	2	21 44 44.89	2.1165	12 15 6.1	7.967
3	19 59 40.44	2.3602	17 16 42.1	4.508	3	21 46 51.74	2.1118	12 7 6.6	8.018
4	20 2 1.89	2.3548	17 12 8.7	4.604	4	21 48 58.31	2.1072	11 59 4.0	8.068
5	20 4 23.02	2.3495	17 7 29.6	4.699	5	21 51 4.61	2.1027	11 50 58.4	8.117
6	20 6 43.83	2.3442	17 2 44.8	4.794	6	21 53 10.64	2.0983	11 42 49.9	8.166
7	20 9 4.33	2.3389	16 57 54.3	4.887	7	21 55 16.40	2.0938	11 34 38.5	8.214
8	20 11 24.50	2.3335	16 52 58.3	4.980	8	21 57 21.89	2.0893	11 26 24.2	8.261
9	20 13 44.35	2.3282	16 47 56.7	5.071	9	21 59 27.12	2.0850	11 18 7.2	8.306
10	20 16 3.88	2.3228	16 42 49.8	5.161	10	22 1 32.09	2.0806	11 9 47.5	8.350
11	20 18 23.08	2.3173	16 37 37.4	5.251	11	22 3 36.79	2.0763	11 1 25.2	8.394
12	20 20 41.96	2.3120	16 32 19.7	5.339	12	22 5 41.24	2.0721	10 53 0.2	8.438
13	20 23 0.52	2.3066	16 26 56.7	5.426	13	22 7 45.44	2.0678	10 44 32.6	8.481
14	20 25 18.75	2.3012	16 21 28.6	5.512	14	22 9 49.38	2.0636	10 36 2.5	8.522
15	20 27 36.66	2.2958	16 15 55.3	5.598	15	22 11 53.07	2.0595	10 27 30.0	8.563
16	20 29 54.24	2.2904	16 10 16.9	5.683	16	22 13 56.52	2.0555	10 18 55.0	8.603
17	20 32 11.51	2.2851	16 4 33.4	5.766	17	22 15 59.73	2.0514	10 10 17.7	8.642
18	20 34 28.45	2.2796	15 58 45.0	5.848	18	22 18 2.69	2.0473	10 1 38.0	8.680
19	20 36 45.06	2.2742	15 52 51.7	5.929	19	22 20 5.41	2.0434	9 52 56.1	8.718
20	20 39 1.36	2.2689	15 46 53.5	6.009	20	22 22 7.90	2.0395	9 44 11.9	8.755
21	20 41 17.33	2.2635	15 40 50.6	6.088	21	22 24 10.15	2.0357	9 35 25.5	8.791
22	20 43 32.98	2.2582	15 34 42.9	6.167	22	22 26 12.18	2.0318	9 26 37.0	8.826
23	20 45 48.31	2.2528	-15 28 30.5	+6.241	23	22 28 13.97	2.0280	- 9 17 46.4	+8.861
NOVEMBER 14.					NOVEMBER 16.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	20 48 3.32	2.2475	-15 22 13.6	+6.320	0	22 30 15.54	2.0213	- 9 8 53.7	+8.895
1	20 50 18.01	2.2422	15 15 52.1	6.396	1	22 32 16.89	2.0206	8 59 59.0	8.928
2	20 52 32.38	2.2368	15 9 26.1	6.470	2	22 34 18.01	2.0169	8 51 2.4	8.959
3	20 54 46.43	2.2316	15 2 55.7	6.543	3	22 36 18.92	2.0134	8 42 3.9	8.991
4	20 57 0.17	2.2263	14 56 20.9	6.616	4	22 38 19.62	2.0099	8 33 3.5	9.022
5	20 59 13.59	2.2211	14 49 41.8	6.687	5	22 40 20.11	2.0064	8 24 1.3	9.052
6	21 1 26.70	2.2158	14 42 58.5	6.758	6	22 42 20.39	2.0029	8 14 57.3	9.081
7	21 3 39.49	2.2106	14 36 10.9	6.828	7	22 44 20.46	1.9995	8 5 51.6	9.109
8	21 5 51.97	2.2054	14 29 19.2	6.896	8	22 46 20.33	1.9962	7 56 44.2	9.137
9	21 8 4.14	2.2002	14 22 23.4	6.963	9	22 48 20.00	1.9929	7 47 35.2	9.164
10	21 10 16.00	2.1951	14 15 23.6	7.029	10	22 50 19.48	1.9897	7 38 24.5	9.191
11	21 12 27.55	2.1899	14 8 19.9	7.095	11	22 52 18.76	1.9864	7 29 12.3	9.216
12	21 14 38.79	2.1848	14 1 12.2	7.160	12	22 54 17.85	1.9832	7 19 58.6	9.241
13	21 16 49.73	2.1797	13 54 0.7	7.223	13	22 56 16.75	1.9802	7 10 43.4	9.265
14	21 19 0.36	2.1747	13 46 45.4	7.287	14	22 58 15.47	1.9772	7 1 26.8	9.288
15	21 21 10.69	2.1697	13 39 26.3	7.348	15	23 0 14.01	1.9742	6 52 8.8	9.312
16	21 23 20.72	2.1647	13 32 3.6	7.408	16	23 2 12.37	1.9712	6 42 49.4	9.334
17	21 25 30.45	2.1597	13 24 37.3	7.469	17	23 4 10.55	1.9683	6 33 28.7	9.355
18	21 27 39.88	2.1548	13 17 7.3	7.528	18	23 6 8.57	1.9655	6 24 6.8	9.375
19	21 29 49.02	2.1499	13 9 33.9	7.586	19	23 8 6.41	1.9626	6 14 43.7	9.396
20	21 31 57.87	2.1450	13 1 57.0	7.643	20	23 10 4.08	1.9598	6 5 19.3	9.416
21	21 34 6.42	2.1401	12 54 16.7	7.699	21	23 12 1.59	1.9572	5 55 53.8	9.434
22	21 36 14.68	2.1353	12 46 33.1	7.754	22	23 13 58.94	1.9545	5 46 27.2	9.452
23	21 38 22.66	2.1306	12 38 46.2	7.809	23	23 15 56.13	1.9519	5 36 59.5	9.470
24	21 40 30.35	2.1258	-12 30 56.0	+7.863	24	23 17 53.17	1.9493	- 5 27 30.8	+9.487

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 17.					NOVEMBER 19.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 17 53.17	1.9493	-5 27 30.8	+9.487	0	0 49 27.05	1.8843	+2 15 23.8	+9.573
1	23 19 50.05	1.9468	5 18 1.1	9.503	1	0 51 20.10	1.8840	2 24 57.8	9.561
2	23 21 46.79	1.9444	5 8 30.5	9.518	2	0 53 13.13	1.8838	2 34 31.1	9.548
3	23 23 43.38	1.9420	4 58 58.9	9.533	3	0 55 6.16	1.8837	2 44 3.6	9.535
4	23 25 39.83	1.9397	4 49 26.5	9.548	4	0 56 59.18	1.8837	2 53 35.3	9.521
5	23 27 36.14	1.9374	4 39 53.2	9.561	5	0 58 52.20	1.8836	3 3 6.1	9.506
6	23 29 32.32	1.9352	4 30 19.2	9.573	6	1 0 45.21	1.8836	3 12 36.0	9.491
7	23 31 28.36	1.9329	4 20 44.4	9.587	7	1 2 38.23	1.8836	3 22 5.0	9.476
8	23 33 24.27	1.9307	4 11 8.8	9.598	8	1 4 31.25	1.8837	3 31 33.1	9.459
9	23 35 20.05	1.9286	4 1 32.6	9.608	9	1 6 24.28	1.8838	3 41 0.1	9.442
10	23 37 15.70	1.9265	3 51 55.8	9.619	10	1 8 17.31	1.8840	3 50 26.1	9.425
11	23 39 11.23	1.9216	3 42 18.3	9.629	11	1 10 10.36	1.8842	3 59 51.1	9.407
12	23 41 6.65	1.9227	3 32 40.3	9.638	12	1 12 3.42	1.8844	4 9 14.9	9.388
13	23 43 1.95	1.9207	3 23 1.8	9.647	13	1 13 56.49	1.8847	4 18 37.6	9.369
14	23 44 57.13	1.9188	3 13 22.7	9.655	14	1 15 49.59	1.8851	4 27 59.2	9.349
15	23 46 52.21	1.9170	3 3 43.2	9.662	15	1 17 42.70	1.8854	4 37 19.5	9.329
16	23 48 47.17	1.9153	2 54 3.3	9.668	16	1 19 35.84	1.8858	4 46 38.7	9.309
17	23 50 42.04	1.9136	2 44 23.0	9.674	17	1 21 29.00	1.8863	4 55 56.6	9.288
18	23 52 36.80	1.9119	2 34 42.4	9.680	18	1 23 22.20	1.8868	5 5 13.2	9.265
19	23 54 31.47	1.9103	2 25 1.4	9.685	19	1 25 15.42	1.8873	5 14 28.4	9.243
20	23 56 26.04	1.9088	2 15 20.2	9.689	20	1 27 8.67	1.8878	5 23 42.3	9.220
21	23 58 20.52	1.9073	2 5 38.7	9.693	21	1 29 1.96	1.8885	5 32 54.8	9.197
22	0 0 14.91	1.9058	1 55 57.1	9.696	22	1 30 55.29	1.8891	5 42 5.9	9.173
23	0 2 9.21	1.9043	-1 46 15.2	+9.699	23	1 32 48.65	1.8898	+5 51 15.5	+9.148
NOVEMBER 18.					NOVEMBER 20.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 4 3.43	1.9030	-1 36 33.2	+9.701	0	1 34 42.06	1.8905	+6 0 23.6	+9.123
1	0 5 57.57	1.9017	1 26 51.1	9.702	1	1 36 35.51	1.8912	6 9 30.2	9.097
2	0 7 51.63	1.9004	1 17 9.0	9.703	2	1 38 29.01	1.8920	6 18 35.2	9.070
3	0 9 45.62	1.8992	1 7 26.8	9.703	3	1 40 22.55	1.8928	6 27 38.6	9.043
4	0 11 39.54	1.8980	0 57 44.7	9.703	4	1 42 16.15	1.8937	6 36 40.3	9.016
5	0 13 33.38	1.8968	0 48 2.5	9.702	5	1 44 9.79	1.8945	6 45 40.5	8.988
6	0 15 27.16	1.8958	0 38 20.5	9.699	6	1 46 3.49	1.8955	6 54 38.9	8.959
7	0 17 20.88	1.8948	0 28 38.6	9.697	7	1 47 57.25	1.8965	7 3 35.6	8.930
8	0 19 14.54	1.8938	0 18 56.8	9.695	8	1 49 51.07	1.8974	7 12 30.5	8.900
9	0 21 8.13	1.8928	-0 9 15.2	9.692	9	1 51 44.94	1.8984	7 21 23.6	8.870
10	0 23 1.68	1.8920	+0 0 26.2	9.688	10	1 53 38.88	1.8995	7 30 14.9	8.839
11	0 24 55.17	1.8911	0 10 7.4	9.683	11	1 55 32.88	1.9006	7 39 4.3	8.808
12	0 26 48.61	1.8903	0 19 48.2	9.678	12	1 57 26.95	1.9017	7 47 51.8	8.776
13	0 28 42.00	1.8895	0 29 28.7	9.673	13	1 59 21.09	1.9029	7 56 37.4	8.743
14	0 30 35.35	1.8888	0 39 8.9	9.667	14	2 1 15.30	1.9041	8 5 21.0	8.710
15	0 32 28.66	1.8882	0 48 48.7	9.660	15	2 3 9.58	1.9053	8 14 2.6	8.677
16	0 34 21.93	1.8876	0 58 28.1	9.652	16	2 5 3.93	1.9066	8 22 42.2	8.643
17	0 36 15.17	1.8870	1 8 7.0	9.644	17	2 6 58.37	1.9079	8 31 19.7	8.608
18	0 38 8.37	1.8865	1 17 45.4	9.636	18	2 8 52.88	1.9092	8 39 55.1	8.573
19	0 40 1.55	1.8860	1 27 23.3	9.627	19	2 10 47.47	1.9105	8 48 28.4	8.537
20	0 41 54.69	1.8855	1 37 0.7	9.618	20	2 12 42.14	1.9119	8 56 59.5	8.499
21	0 43 47.81	1.8852	1 46 37.5	9.608	21	2 14 36.90	1.9133	9 5 28.3	8.462
22	0 45 40.91	1.8848	1 56 13.6	9.596	22	2 16 31.74	1.9147	9 13 55.0	8.425
23	0 47 33.99	1.8845	2 5 49.0	9.585	23	2 18 26.66	1.9162	9 22 19.3	8.387
24	0 49 27.05	1.8843	+2 15 23.8	+9.573	24	2 20 21.68	1.9178	+9 30 41.4	+8.348

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 21.					NOVEMBER 23.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	2 20 21.68	1.9178	+ 9 30 41.4	+8.348	0	3 54 32.11	2.0122	+15 16 1.0	+5.825
1	2 22 16.79	1.9192	9 39 1.1	8.309	1	3 56 32.91	2.0143	15 21 48.5	5.759
2	2 24 11.98	1.9207	9 47 18.5	8.269	2	3 58 33.83	2.0165	15 27 32.1	5.693
3	2 26 7.27	1.9223	9 55 33.4	8.228	3	4 0 34.89	2.0188	15 33 11.7	5.626
4	2 28 2.66	1.9239	10 3 45.9	8.188	4	4 2 36.09	2.0210	15 38 47.2	5.558
5	2 29 58.14	1.9255	10 11 55.9	8.147	5	4 4 37.41	2.0232	15 44 18.7	5.490
6	2 31 53.72	1.9272	10 20 3.5	8.104	6	4 6 38.87	2.0255	15 49 46.0	5.422
7	2 33 49.40	1.9288	10 28 8.4	8.061	7	4 8 40.47	2.0277	15 55 9.3	5.353
8	2 35 45.18	1.9305	10 36 10.8	8.018	8	4 10 42.20	2.0299	16 0 28.3	5.283
9	2 37 41.06	1.9322	10 44 10.6	7.974	9	4 12 44.06	2.0321	16 5 43.2	5.213
10	2 39 37.05	1.9340	10 52 7.7	7.930	10	4 14 46.05	2.0343	16 10 53.8	5.142
11	2 41 33.14	1.9358	11 0 2.2	7.885	11	4 16 48.18	2.0366	16 16 0.2	5.071
12	2 43 29.34	1.9376	11 7 53.9	7.839	12	4 18 50.44	2.0388	16 21 2.3	4.999
13	2 45 25.65	1.9393	11 15 42.9	7.793	13	4 20 52.83	2.0410	16 26 0.1	4.927
14	2 47 22.06	1.9412	11 23 29.0	7.746	14	4 22 55.36	2.0432	16 30 53.6	4.855
15	2 49 18.59	1.9430	11 31 12.4	7.699	15	4 24 58.01	2.0453	16 35 42.7	4.781
16	2 51 15.22	1.9448	11 38 52.9	7.651	16	4 27 0.80	2.0476	16 40 27.3	4.707
17	2 53 11.97	1.9467	11 46 30.5	7.602	17	4 29 3.72	2.0497	16 45 7.6	4.634
18	2 55 8.83	1.9487	11 54 5.2	7.553	18	4 31 6.76	2.0518	16 49 43.4	4.559
19	2 57 5.81	1.9506	12 1 36.9	7.504	19	4 33 9.94	2.0541	16 54 14.7	4.484
20	2 59 2.90	1.9525	12 9 5.7	7.454	20	4 35 13.25	2.0562	16 58 41.5	4.409
21	3 1 0.11	1.9545	12 16 31.4	7.403	21	4 37 16.68	2.0583	17 3 3.8	4.333
22	3 2 57.44	1.9565	12 23 54.1	7.352	22	4 39 20.24	2.0604	17 7 21.5	4.256
23	3 4 54.89	1.9585	+12 31 13.7	+7.300	23	4 41 23.93	2.0626	+17 11 34.5	+4.179
NOVEMBER 22.					NOVEMBER 24.				
0	3 6 52.46	1.9605	+12 38 30.1	+7.248	0	4 43 27.75	2.0647	+17 15 43.0	+4.102
1	3 8 50.15	1.9625	12 45 43.4	7.195	1	4 45 31.69	2.0668	17 19 46.8	4.025
2	3 10 47.96	1.9646	12 52 53.5	7.142	2	4 47 35.76	2.0688	17 23 46.0	3.947
3	3 12 45.90	1.9666	13 0 0.4	7.088	3	4 49 39.95	2.0708	17 27 40.4	3.868
4	3 14 43.95	1.9686	13 7 4.0	7.033	4	4 51 44.26	2.0729	17 31 30.2	3.789
5	3 16 42.13	1.9707	13 14 4.3	6.978	5	4 53 48.70	2.0749	17 35 15.1	3.709
6	3 18 40.44	1.9728	13 21 1.3	6.923	6	4 55 53.25	2.0769	17 38 55.3	3.630
7	3 20 38.87	1.9749	13 27 55.0	6.867	7	4 57 57.93	2.0790	17 42 30.7	3.549
8	3 22 37.43	1.9771	13 34 45.3	6.809	8	5 0 2.73	2.0810	17 46 1.2	3.468
9	3 24 36.12	1.9793	13 41 32.1	6.752	9	5 2 7.65	2.0829	17 49 26.9	3.387
10	3 26 34.94	1.9813	13 48 15.5	6.694	10	5 4 12.68	2.0848	17 52 47.7	3.307
11	3 28 33.88	1.9835	13 54 55.4	6.635	11	5 6 17.83	2.0868	17 56 3.7	3.225
12	3 30 32.96	1.9857	14 1 31.7	6.576	12	5 8 23.10	2.0888	17 59 14.7	3.143
13	3 32 32.16	1.9878	14 8 4.5	6.517	13	5 10 28.48	2.0907	18 2 20.8	3.060
14	3 34 31.50	1.9901	14 14 33.7	6.457	14	5 12 33.98	2.0926	18 5 21.9	2.977
15	3 36 30.97	1.9922	14 20 59.3	6.396	15	5 14 39.59	2.0943	18 8 18.0	2.893
16	3 38 30.56	1.9943	14 27 21.2	6.334	16	5 16 45.30	2.0962	18 11 9.1	2.810
17	3 40 30.29	1.9966	14 33 39.4	6.272	17	5 18 51.13	2.0981	18 13 55.2	2.726
18	3 42 30.15	1.9988	14 39 53.9	6.211	18	5 20 57.07	2.0998	18 16 36.2	2.642
19	3 44 30.15	2.0010	14 46 4.7	6.148	19	5 23 3.11	2.1016	18 19 12.2	2.557
20	3 46 30.27	2.0032	14 52 11.6	6.084	20	5 25 9.26	2.1034	18 21 43.0	2.472
21	3 48 30.53	2.0055	14 58 14.8	6.021	21	5 27 15.52	2.1052	18 24 8.8	2.387
22	3 50 30.93	2.0077	15 4 14.1	5.956	22	5 29 21.88	2.1068	18 26 29.4	2.300
23	3 52 31.45	2.0098	15 10 9.5	5.891	23	5 31 28.34	2.1085	18 28 44.8	2.214
24	3 54 32.11	2.0122	+15 16 1.0	+5.825	24	5 33 34.90	2.1102	+18 30 55.1	+2.128

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
NOVEMBER 25.					NOVEMBER 27.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	5 33 34.90	2.1102	+18 30 55.1	+2.128	0	7 16 17.66	2.1590	+18 29 18.5	-2.246
1	5 35 41.56	2.1118	18 33 0.2	2.042	1	7 18 27.21	2.1594	18 27 1.0	2.338
2	5 37 48.32	2.1134	18 35 0.1	1.954	2	7 20 36.79	2.1598	18 24 37.9	2.431
3	5 39 55.17	2.1150	18 36 54.7	1.867	3	7 22 46.39	2.1601	18 22 9.3	2.523
4	5 42 2.12	2.1167	18 38 44.1	1.779	4	7 24 56.00	2.1603	18 19 35.1	2.616
5	5 44 9.17	2.1182	18 40 28.2	1.692	5	7 27 5.63	2.1607	18 16 55.4	2.708
6	5 46 16.30	2.1196	18 42 7.1	1.603	6	7 29 15.28	2.1610	18 14 10.1	2.801
7	5 48 23.52	2.1212	18 43 40.6	1.515	7	7 31 24.95	2.1612	18 11 19.3	2.893
8	5 50 30.84	2.1227	18 45 8.9	1.427	8	7 33 34.62	2.1613	18 8 22.9	2.986
9	5 52 38.24	2.1211	18 46 31.8	1.338	9	7 35 44.31	2.1615	18 5 21.0	3.078
10	5 54 45.73	2.1255	18 47 49.4	1.218	10	7 37 54.00	2.1617	18 2 13.6	3.169
11	5 56 53.30	2.1268	18 49 1.6	1.159	11	7 40 3.71	2.1618	17 59 0.7	3.261
12	5 59 0.95	2.1282	18 50 8.5	1.070	12	7 42 13.42	2.1619	17 55 42.3	3.352
13	6 1 8.69	2.1296	18 51 10.0	0.980	13	7 44 23.14	2.1621	17 52 18.4	3.444
14	6 3 16.50	2.1308	18 52 6.1	0.890	14	7 46 32.87	2.1622	17 48 49.0	3.536
15	6 5 24.39	2.1322	18 52 56.8	0.799	15	7 48 42.60	2.1622	17 45 14.1	3.627
16	6 7 32.36	2.1335	18 53 42.0	0.708	16	7 50 52.33	2.1623	17 41 33.8	3.718
17	6 9 40.41	2.1347	18 54 21.8	0.618	17	7 53 2.07	2.1623	17 37 48.0	3.809
18	6 11 48.52	2.1358	18 54 56.2	0.528	18	7 55 11.81	2.1623	17 33 56.7	3.900
19	6 13 56.71	2.1371	18 55 25.2	0.437	19	7 57 21.55	2.1623	17 30 0.0	3.990
20	6 16 4.97	2.1383	18 55 48.6	0.345	20	7 59 31.28	2.1623	17 25 57.9	4.080
21	6 18 13.30	2.1393	18 56 6.6	0.254	21	8 1 41.02	2.1623	17 21 50.4	4.170
22	6 20 21.69	2.1403	18 56 19.1	0.163	22	8 3 50.75	2.1622	17 17 37.5	4.259
23	6 22 30.14	2.1414	+18 56 26.1	+0.071	23	8 6 0.48	2.1622	+17 13 19.3	-4.349
NOVEMBER 26.					NOVEMBER 28.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 24 38.66	2.1425	+18 56 27.6	-0.021	0	8 8 10.21	2.1621	+17 8 55.6	-4.439
1	6 26 47.24	2.1435	18 56 23.6	0.113	1	8 10 19.93	2.1620	17 4 26.6	4.528
2	6 28 55.88	2.1445	18 56 14.0	0.205	2	8 12 29.65	2.1619	16 59 52.2	4.617
3	6 31 4.58	2.1454	18 55 59.0	0.297	3	8 14 39.36	2.1618	16 55 12.5	4.706
4	6 33 13.33	2.1463	18 55 38.4	0.389	4	8 16 49.06	2.1616	16 50 27.5	4.793
5	6 35 22.14	2.1472	18 55 12.3	0.482	5	8 18 58.75	2.1615	16 45 37.3	4.882
6	6 37 31.00	2.1482	18 54 40.6	0.575	6	8 21 8.44	2.1614	16 40 41.7	4.971
7	6 39 39.92	2.1490	18 54 3.3	0.667	7	8 23 18.12	2.1613	16 35 40.8	5.058
8	6 41 48.88	2.1498	18 53 20.6	0.759	8	8 25 27.79	2.1611	16 30 34.7	5.145
9	6 43 57.89	2.1506	18 52 32.2	0.852	9	8 27 37.45	2.1609	16 25 23.4	5.232
10	6 46 6.95	2.1513	18 51 38.3	0.944	10	8 29 47.10	2.1607	16 20 6.9	5.319
11	6 48 16.05	2.1520	18 50 38.9	1.037	11	8 31 56.73	2.1605	16 14 45.1	5.406
12	6 50 25.19	2.1527	18 49 33.8	1.131	12	8 34 6.36	2.1604	16 9 18.2	5.492
13	6 52 34.37	2.1534	18 48 23.2	1.223	13	8 36 15.98	2.1602	16 3 46.1	5.578
14	6 54 43.60	2.1541	18 47 7.0	1.316	14	8 38 25.58	2.1599	15 58 8.9	5.663
15	6 56 52.86	2.1547	18 45 45.3	1.409	15	8 40 35.17	2.1598	15 52 26.5	5.748
16	6 59 2.16	2.1553	18 44 17.9	1.502	16	8 42 44.75	2.1596	15 46 39.1	5.833
17	7 1 11.49	2.1558	18 42 45.0	1.595	17	8 44 54.32	2.1594	15 40 46.6	5.918
18	7 3 20.86	2.1563	18 41 6.5	1.688	18	8 47 3.88	2.1592	15 34 49.0	6.002
19	7 5 30.25	2.1568	18 39 22.5	1.781	19	8 49 13.42	2.1589	15 28 46.4	6.086
20	7 7 39.68	2.1574	18 37 32.8	1.874	20	8 51 22.95	2.1587	15 22 38.7	6.169
21	7 9 49.14	2.1578	18 35 37.6	1.967	21	8 53 32.47	2.1586	15 16 26.1	6.252
22	7 11 58.62	2.1582	18 33 36.8	2.059	22	8 55 41.98	2.1584	15 10 8.5	6.335
23	7 14 8.13	2.1587	18 31 30.5	2.152	23	8 57 51.48	2.1582	15 3 45.9	6.417
24	7 16 17.66	2.1590	+18 29 18.5	-2.246	24	9 0 0.96	2.1579	+14 57 18.4	-6.499

GREENWICH MEAN TIME.

Hour.	Right Ascension.			Var. per Min.	Declination.			Var. per Min.	Hour.	Right Ascension.			Var. per Min.	Declination			Var. per Min.
NOVEMBER 29.									DECEMBER 1.								
	h	m	s	s	°	'	"	"		h	m	s	s	°	'	"	"
0	9	0	0.96	2.1579	+14	57	18.4	-6.499	0	10	43	34.81	2.1648	+8	19	46.9	-9.856
1	9	2	10.43	2.1577	14	50	46.0	6.581	1	10	45	44.72	2.1656	8	9	53.9	9.911
2	9	4	19.89	2.1576	14	44	8.7	6.662	2	10	47	54.68	2.1664	7	59	57.6	9.965
3	9	6	29.34	2.1573	14	37	26.6	6.742	3	10	50	4.69	2.1672	7	49	58.1	10.019
4	9	8	38.77	2.1572	14	30	39.6	6.823	4	10	52	14.74	2.1680	7	39	55.3	10.072
5	9	10	48.20	2.1570	14	23	47.8	6.903	5	10	54	24.85	2.1690	7	29	49.4	10.124
6	9	12	57.61	2.1568	14	16	51.3	6.982	6	10	56	35.02	2.1699	7	19	40.4	10.176
7	9	15	7.01	2.1567	14	9	50.0	7.062	7	10	58	45.24	2.1708	7	9	28.3	10.227
8	9	17	16.41	2.1565	14	2	43.9	7.141	8	11	0	55.52	2.1718	6	59	13.2	10.277
9	9	19	25.79	2.1563	13	55	33.1	7.218	9	11	3	5.86	2.1728	6	48	55.1	10.326
10	9	21	35.17	2.1562	13	48	17.7	7.296	10	11	5	16.26	2.1739	6	38	34.1	10.375
11	9	23	44.54	2.1561	13	40	57.6	7.373	11	11	7	26.73	2.1751	6	28	10.1	10.422
12	9	25	53.90	2.1559	13	33	32.9	7.450	12	11	9	37.27	2.1763	6	17	43.4	10.469
13	9	28	3.25	2.1558	13	26	3.6	7.527	13	11	11	47.88	2.1775	6	7	13.8	10.516
14	9	30	12.60	2.1558	13	18	29.7	7.603	14	11	13	58.57	2.1787	5	56	41.5	10.561
15	9	32	21.95	2.1557	13	10	51.3	7.678	15	11	16	9.32	2.1799	5	46	6.5	10.605
16	9	34	31.29	2.1556	13	3	8.4	7.753	16	11	18	20.16	2.1813	5	35	28.9	10.649
17	9	36	40.62	2.1555	12	55	21.0	7.828	17	11	20	31.08	2.1827	5	24	48.6	10.692
18	9	38	49.95	2.1556	12	47	29.1	7.902	18	11	22	42.08	2.1840	5	14	5.8	10.734
19	9	40	59.29	2.1556	12	39	32.8	7.975	19	11	24	53.16	2.1855	5	3	20.5	10.775
20	9	43	8.62	2.1555	12	31	32.1	8.047	20	11	27	4.34	2.1870	4	52	32.8	10.815
21	9	45	17.95	2.1556	12	23	27.1	8.119	21	11	29	15.60	2.1885	4	41	42.7	10.855
22	9	47	27.29	2.1556	12	15	17.8	8.192	22	11	31	26.96	2.1901	4	30	50.2	10.893
23	9	49	36.62	2.1556	+12	7	4.1	-8.263	23	11	33	38.41	2.1917	+4	19	55.5	-10.931
NOVEMBER 30.									DECEMBER 2.								
0	9	51	45.96	2.1557	+11	58	46.2	-8.333	0	11	35	49.96	2.1933	+4	8	58.5	-10.968
1	9	53	55.30	2.1558	11	50	24.1	8.404	1	11	38	1.61	2.1951	3	57	59.3	11.003
2	9	56	4.65	2.1559	11	41	57.7	8.474	2	11	40	13.37	2.1968	3	46	58.1	11.038
3	9	58	14.01	2.1560	11	33	27.2	8.543	3	11	42	25.23	2.1986	3	35	54.7	11.073
4	10	0	23.37	2.1562	11	24	52.6	8.612	4	11	44	37.20	2.2004	3	24	49.3	11.106
5	10	2	32.75	2.1563	11	16	13.8	8.680	5	11	46	49.28	2.2023	3	13	42.0	11.138
6	10	4	42.13	2.1565	11	7	31.0	8.747	6	11	49	1.47	2.2043	3	2	32.8	11.169
7	10	6	51.53	2.1568	10	58	44.2	8.813	7	11	51	13.79	2.2063	2	51	21.7	11.199
8	10	9	0.95	2.1570	10	49	53.4	8.880	8	11	53	26.22	2.2082	2	40	8.9	11.228
9	10	11	10.37	2.1573	10	40	58.6	8.946	9	11	55	38.77	2.2102	2	28	54.3	11.257
10	10	13	19.82	2.1577	10	31	59.9	9.011	10	11	57	51.45	2.2123	2	17	38.1	11.284
11	10	15	29.29	2.1579	10	22	57.3	9.075	11	12	0	4.25	2.2145	2	6	20.2	11.311
12	10	17	38.77	2.1582	10	13	50.9	9.138	12	12	2	17.19	2.2167	1	55	0.8	11.336
13	10	19	48.28	2.1587	10	4	40.7	9.202	13	12	4	30.25	2.2189	1	43	39.9	11.359
14	10	21	57.81	2.1590	9	55	26.6	9.266	14	12	6	43.46	2.2212	1	32	17.7	11.383
15	10	24	7.36	2.1595	9	46	8.8	9.328	15	12	8	56.80	2.2235	1	20	54.0	11.406
16	10	26	16.95	2.1600	9	36	47.3	9.388	16	12	11	10.28	2.2258	1	9	29.0	11.427
17	10	28	26.56	2.1604	9	27	22.2	9.449	17	12	13	23.90	2.2282	0	58	2.8	11.446
18	10	30	36.20	2.1610	9	17	53.4	9.510	18	12	15	37.67	2.2307	0	46	35.5	11.465
19	10	32	45.88	2.1616	9	8	21.0	9.569	19	12	17	51.59	2.2333	0	35	7.0	11.483
20	10	34	55.59	2.1622	8	58	45.1	9.627	20	12	20	5.67	2.2358	0	23	37.5	11.500
21	10	37	5.34	2.1627	8	49	5.7	9.685	21	12	22	19.89	2.2383	0	12	7.0	11.516
22	10	39	15.12	2.1633	8	39	22.9	9.743	22	12	24	34.27	2.2411	+0	0	35.6	11.530
23	10	41	24.94	2.1641	8	29	36.6	9.800	23	12	26	48.82	2.2438	-0	10	56.6	11.543
24	10	43	34.81	2.1648	+8	19	46.9	-9.856	24	12	29	3.52	2.2464	-0	22	29.6	-11.556

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 3.					DECEMBER 5.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	12 29 3.52	2.2464	-0 22 29.6	-11.556	0	14 20 47.30	2.4213	-9 27 17.0	-10.614
1	12 31 18.39	2.2492	0 34 3.3	11.567	1	14 23 12.70	2.1254	9 37 52.2	10.559
2	12 33 33.43	2.2521	0 45 37.6	11.577	2	14 25 38.35	2.4296	9 48 24.1	10.502
3	12 35 48.64	2.2549	0 57 12.5	11.586	3	14 28 4.25	2.4339	9 58 52.5	10.444
4	12 38 4.02	2.2578	1 8 47.9	11.593	4	14 30 30.42	2.4382	10 9 17.4	10.385
5	12 40 19.57	2.2608	1 20 23.7	11.600	5	14 32 56.84	2.4424	10 19 38.7	10.321
6	12 42 35.31	2.2638	1 31 59.9	11.605	6	14 35 23.51	2.4466	10 29 56.3	10.262
7	12 44 51.23	2.2668	1 43 36.3	11.609	7	14 37 50.43	2.4508	10 40 10.1	10.198
8	12 47 7.33	2.2698	1 55 13.0	11.612	8	14 40 17.61	2.4551	10 50 20.0	10.133
9	12 49 23.61	2.2730	2 6 49.8	11.613	9	14 42 45.04	2.4593	11 0 26.0	10.065
10	12 51 40.09	2.2762	2 18 26.6	11.613	10	14 45 12.73	2.4636	11 10 27.8	9.996
11	12 53 56.75	2.2793	2 30 3.4	11.612	11	14 47 40.67	2.4678	11 20 25.5	9.926
12	12 56 13.61	2.2827	2 41 40.1	11.610	12	14 50 8.86	2.4719	11 30 18.9	9.854
13	12 58 30.67	2.2859	2 53 16.6	11.607	13	14 52 37.30	2.4762	11 40 8.0	9.781
14	13 0 47.92	2.2892	3 4 52.9	11.603	14	14 55 6.00	2.4803	11 49 52.6	9.706
15	13 3 5.37	2.2926	3 16 28.9	11.597	15	14 57 34.94	2.4844	11 59 32.7	9.630
16	13 5 23.03	2.2960	3 28 4.5	11.589	16	15 0 4.13	2.4886	12 9 8.2	9.552
17	13 7 40.89	2.2994	3 39 39.6	11.581	17	15 2 33.57	2.4927	12 18 38.9	9.473
18	13 9 58.96	2.3029	3 51 14.2	11.571	18	15 5 3.26	2.4968	12 28 4.9	9.392
19	13 12 17.24	2.3064	4 2 48.1	11.559	19	15 7 33.19	2.5008	12 37 25.9	9.309
20	13 14 35.73	2.3099	4 14 21.3	11.547	20	15 10 3.36	2.5049	12 46 42.0	9.226
21	13 16 54.43	2.3136	4 25 53.7	11.532	21	15 12 33.78	2.5089	12 55 53.0	9.141
22	13 19 13.36	2.3172	4 37 25.1	11.517	22	15 15 4.43	2.5129	13 4 58.9	9.054
23	13 21 32.50	2.3208	-4 48 55.7	-11.501	23	15 17 35.33	2.5169	-13 13 59.5	-8.965
DECEMBER 4.					DECEMBER 6.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 23 51.86	2.3245	-5 0 25.2	-11.483	0	15 20 6.46	2.5208	-13 22 54.7	-8.875
1	13 26 11.44	2.3283	5 11 53.6	11.463	1	15 22 37.82	2.5247	13 31 44.5	8.785
2	13 28 31.25	2.3321	5 23 20.7	11.442	2	15 25 9.42	2.5285	13 40 28.9	8.693
3	13 30 51.29	2.3358	5 34 46.6	11.420	3	15 27 41.24	2.5323	13 49 7.6	8.598
4	13 33 11.55	2.3397	5 46 11.1	11.397	4	15 30 13.29	2.5361	13 57 40.6	8.503
5	13 35 32.05	2.3436	5 57 34.2	11.372	5	15 32 45.57	2.5398	14 6 7.9	8.407
6	13 37 52.78	2.3474	6 8 55.7	11.344	6	15 35 18.06	2.5433	14 14 29.4	8.308
7	13 40 13.74	2.3513	6 20 15.5	11.316	7	15 37 50.77	2.5470	14 22 44.9	8.208
8	13 42 34.94	2.3553	6 31 33.6	11.287	8	15 40 23.70	2.5506	14 30 54.4	8.107
9	13 44 56.37	2.3593	6 42 49.9	11.256	9	15 42 56.84	2.5541	14 38 57.8	8.006
10	13 47 18.05	2.3633	6 54 4.3	11.223	10	15 45 30.19	2.5576	14 46 55.1	7.903
11	13 49 39.96	2.3673	7 5 16.7	11.190	11	15 48 3.75	2.5610	14 54 46.1	7.798
12	13 52 2.12	2.3713	7 16 27.1	11.155	12	15 50 37.51	2.5643	15 2 30.8	7.692
13	13 54 24.52	2.3754	7 27 35.3	11.118	13	15 53 11.47	2.5676	15 10 9.1	7.584
14	13 56 47.17	2.3795	7 38 41.3	11.079	14	15 55 45.62	2.5708	15 17 40.9	7.475
15	13 59 10.06	2.3835	7 49 44.8	11.039	15	15 58 19.97	2.5740	15 25 6.1	7.365
16	14 1 33.19	2.3877	8 0 46.0	10.998	16	16 0 54.50	2.5771	15 32 24.7	7.254
17	14 3 56.58	2.3919	8 11 44.6	10.956	17	16 3 29.22	2.5801	15 39 36.6	7.142
18	14 6 20.22	2.3960	8 22 40.7	10.912	18	16 6 4.11	2.5830	15 46 41.8	7.029
19	14 8 44.10	2.4002	8 33 34.0	10.865	19	16 8 39.18	2.5859	15 53 40.1	6.914
20	14 11 8.24	2.4043	8 44 24.5	10.818	20	16 11 14.42	2.5887	16 0 31.5	6.799
21	14 13 32.62	2.4085	8 55 12.2	10.770	21	16 13 49.83	2.5914	16 7 16.0	6.682
22	14 15 57.26	2.4127	9 5 56.9	10.719	22	16 16 25.39	2.5940	16 13 53.4	6.564
23	14 18 22.15	2.4170	9 16 38.5	10.667	23	16 19 1.11	2.5967	16 20 23.7	6.445
24	14 20 47.30	2.4213	-9 27 17.0	-10.614	24	16 21 36.99	2.5992	-16 26 46.8	-6.325

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 7.					DECEMBER 9.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	16 21 36.99	2.5992	-16 26 46.8	-6.325	0	18 27 21.23	2.5980	-18 59 4.7	+0.099
1	16 24 13.01	2.6016	16 33 2.7	6.204	1	18 29 57.03	2.5952	18 58 54.7	0.234
2	16 26 49.18	2.6039	16 39 11.3	6.082	2	18 32 32.66	2.5924	18 58 36.6	0.369
3	16 29 25.48	2.6061	16 45 12.5	5.959	3	18 35 8.12	2.5894	18 58 10.4	0.503
4	16 32 1.91	2.6082	16 51 6.4	5.835	4	18 37 43.41	2.5865	18 57 36.2	0.637
5	16 34 38.46	2.6103	16 56 52.7	5.710	5	18 40 18.50	2.5833	18 56 54.0	0.770
6	16 37 15.14	2.6123	17 2 31.6	5.585	6	18 42 53.41	2.5802	18 56 3.8	0.903
7	16 39 51.93	2.6141	17 8 2.9	5.458	7	18 45 28.12	2.5768	18 55 5.6	1.035
8	16 42 28.83	2.6158	17 13 26.6	5.331	8	18 48 2.62	2.5733	18 53 59.6	1.166
9	16 45 5.83	2.6175	17 18 42.6	5.203	9	18 50 36.92	2.5699	18 52 45.7	1.297
10	16 47 42.93	2.6191	17 23 50.9	5.074	10	18 53 11.01	2.5663	18 51 24.0	1.427
11	16 50 20.12	2.6206	17 28 51.5	4.944	11	18 55 44.87	2.5625	18 49 54.5	1.557
12	16 52 57.40	2.6220	17 33 44.2	4.813	12	18 58 18.51	2.5587	18 48 17.2	1.686
13	16 55 34.76	2.6233	17 38 29.1	4.682	13	19 0 51.92	2.5548	18 46 32.2	1.813
14	16 58 12.19	2.6244	17 43 6.1	4.550	14	19 3 25.09	2.5508	18 44 39.6	1.940
15	17 0 49.69	2.6255	17 47 35.1	4.418	15	19 5 58.02	2.5468	18 42 39.4	2.067
16	17 3 27.25	2.6264	17 51 56.2	4.285	16	19 8 30.70	2.5427	18 40 31.6	2.193
17	17 6 4.86	2.6272	17 56 9.3	4.151	17	19 11 3.14	2.5384	18 38 16.3	2.318
18	17 8 42.52	2.6280	18 0 14.3	4.017	18	19 13 35.31	2.5341	18 35 53.5	2.442
19	17 11 20.22	2.6286	18 4 11.3	3.883	19	19 16 7.23	2.5298	18 33 23.3	2.565
20	17 13 57.95	2.6292	18 8 0.3	3.748	20	19 18 38.89	2.5253	18 30 45.7	2.687
21	17 16 35.72	2.6296	18 11 41.1	3.612	21	19 21 10.27	2.5208	18 28 0.9	2.808
22	17 19 13.50	2.6298	18 15 13.7	3.476	22	19 23 41.38	2.5162	18 25 8.8	2.929
23	17 21 51.30	2.6301	-18 18 38.2	-3.340	23	19 26 12.21	2.5115	-18 22 9.4	+3.049
DECEMBER 8.					DECEMBER 10.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	17 24 29.11	2.6302	-18 21 54.5	-3.203	0	19 28 42.76	2.5068	-18 19 2.9	+3.168
1	17 27 6.92	2.6301	18 25 2.6	3.066	1	19 31 13.03	2.5020	18 15 49.3	3.285
2	17 29 44.72	2.6300	18 28 2.4	2.928	2	19 33 43.00	2.4970	18 12 28.7	3.402
3	17 32 22.52	2.6297	18 30 54.0	2.791	3	19 36 12.67	2.4921	18 9 1.1	3.518
4	17 35 0.29	2.6293	18 33 37.3	2.653	4	19 38 42.05	2.4872	18 5 26.6	3.633
5	17 37 38.04	2.6288	18 36 12.4	2.516	5	19 41 11.13	2.4822	18 1 45.2	3.747
6	17 40 15.75	2.6282	18 38 39.2	2.378	6	19 43 39.91	2.4770	17 57 57.0	3.859
7	17 42 53.43	2.6276	18 40 57.7	2.239	7	19 46 8.37	2.4718	17 54 2.1	3.970
8	17 45 31.06	2.6267	18 43 7.9	2.101	8	19 48 36.53	2.4667	17 50 0.6	4.081
9	17 48 8.63	2.6258	18 45 9.8	1.963	9	19 51 4.37	2.4613	17 45 52.4	4.191
10	17 50 46.15	2.6248	18 47 3.4	1.824	10	19 53 31.89	2.4561	17 41 37.7	4.299
11	17 53 23.60	2.6235	18 48 48.7	1.685	11	19 55 59.10	2.4508	17 37 16.5	4.407
12	17 56 0.97	2.6222	18 50 25.6	1.547	12	19 58 25.98	2.4453	17 32 48.8	4.514
13	17 58 38.26	2.6208	18 51 54.3	1.409	13	20 0 52.54	2.4398	17 28 14.8	4.619
14	18 1 15.47	2.6193	18 53 14.7	1.271	14	20 3 18.76	2.4343	17 23 34.5	4.723
15	18 3 52.58	2.6177	18 54 26.8	1.133	15	20 5 44.66	2.4288	17 18 48.1	4.826
16	18 6 29.59	2.6159	18 55 30.6	0.994	16	20 8 10.22	2.4233	17 13 55.4	4.928
17	18 9 6.49	2.6141	18 56 26.1	0.857	17	20 10 35.45	2.4178	17 8 56.7	5.028
18	18 11 43.28	2.6122	18 57 13.4	0.720	18	20 13 0.35	2.4122	17 3 52.0	5.128
19	18 14 19.95	2.6101	18 57 52.5	0.583	19	20 15 24.91	2.4065	16 58 41.3	5.227
20	18 16 56.49	2.6078	18 58 23.3	0.445	20	20 17 49.13	2.4008	16 53 24.7	5.325
21	18 19 32.89	2.6055	18 58 45.9	0.308	21	20 20 13.00	2.3951	16 48 2.3	5.421
22	18 22 9.15	2.6032	18 59 0.3	0.172	22	20 22 36.54	2.3894	16 42 34.2	5.517
23	18 24 45.27	2.6007	18 59 6.6	-0.037	23	20 24 59.73	2.3836	16 37 0.3	5.611
24	18 27 21.23	2.5980	-18 59 4.7	+0.099	24	20 27 22.57	2.3778	-16 31 20.9	+5.703

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 11.					DECEMBER 13.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	20 27 22.57	2.3778	-16 31 20.9	+5.703	0	22 14 55.00	2.1107	-10 32 11.2	+8.842
1	20 29 45.07	2.3721	16 25 35.9	5.795	1	22 17 1.49	2.1058	10 23 19.5	8.883
2	20 32 7.22	2.3663	16 19 45.5	5.885	2	22 19 7.70	2.1011	10 14 25.3	8.922
3	20 34 29.02	2.3604	16 13 49.7	5.975	3	22 21 13.62	2.0962	10 5 28.9	8.958
4	20 36 50.47	2.3547	16 7 48.5	6.064	4	22 23 19.25	2.0915	9 56 30.3	8.996
5	20 39 11.58	2.3488	16 1 42.0	6.151	5	22 25 24.60	2.0869	9 47 29.4	9.033
6	20 41 32.33	2.3429	15 55 30.4	6.237	6	22 27 29.68	2.0823	9 38 26.4	9.068
7	20 43 52.73	2.3372	15 49 13.6	6.322	7	22 29 34.47	2.0777	9 29 21.3	9.103
8	20 46 12.79	2.3313	15 42 51.8	6.405	8	22 31 39.00	2.0732	9 20 14.1	9.136
9	20 48 32.49	2.3254	15 36 25.0	6.487	9	22 33 43.26	2.0688	9 11 5.0	9.168
10	20 50 51.84	2.3196	15 29 53.3	6.569	10	22 35 47.25	2.0643	9 1 53.9	9.200
11	20 53 10.84	2.3138	15 23 16.7	6.649	11	22 37 50.97	2.0599	8 52 41.0	9.231
12	20 55 29.49	2.3079	15 16 35.4	6.728	12	22 39 54.44	2.0557	8 43 26.2	9.261
13	20 57 47.79	2.3020	15 9 49.4	6.806	13	22 41 57.65	2.0513	8 34 9.7	9.290
14	21 0 5.73	2.2962	15 2 58.7	6.883	14	22 44 0.60	2.0472	8 24 51.4	9.319
15	21 2 23.33	2.2903	14 56 3.5	6.958	15	22 46 3.31	2.0430	8 15 31.4	9.347
16	21 4 40.57	2.2845	14 49 3.7	7.032	16	22 48 5.76	2.0388	8 6 9.8	9.373
17	21 6 57.47	2.2787	14 41 59.6	7.106	17	22 50 7.97	2.0347	7 56 46.6	9.399
18	21 9 14.02	2.2729	14 34 51.0	7.178	18	22 52 9.93	2.0307	7 47 21.9	9.424
19	21 11 30.22	2.2672	14 27 38.2	7.249	19	22 54 11.66	2.0268	7 37 55.7	9.449
20	21 13 46.08	2.2614	14 20 21.1	7.319	20	22 56 13.15	2.0229	7 28 28.0	9.473
21	21 16 1.59	2.2556	14 12 59.9	7.388	21	22 58 14.41	2.0192	7 18 59.0	9.495
22	21 18 16.75	2.2498	14 5 34.6	7.456	22	23 0 15.45	2.0153	7 9 28.6	9.517
23	21 20 31.57	2.2442	-13 58 5.2	+7.523	23	23 2 16.25	2.0115	- 6 59 56.9	+9.538
DECEMBER 12.					DECEMBER 14.				
0	h m s	s	° ' "	"	0	h m s	s	° ' "	"
0	21 22 46.05	2.2385	-13 50 31.9	+7.588	0	23 4 16.83	2.0078	- 6 50 24.0	+9.558
1	21 25 0.19	2.2328	13 42 54.7	7.652	1	23 6 17.19	2.0042	6 40 49.9	9.578
2	21 27 13.98	2.2271	13 35 13.7	7.715	2	23 8 17.34	2.0007	6 31 14.6	9.597
3	21 29 27.44	2.2215	13 27 28.9	7.777	3	23 10 17.27	1.9971	6 21 38.2	9.616
4	21 31 40.56	2.2159	13 19 40.4	7.838	4	23 12 16.99	1.9937	6 12 0.7	9.633
5	21 33 53.35	2.2103	13 11 48.3	7.898	5	23 14 16.51	1.9903	6 2 22.2	9.650
6	21 36 5.80	2.2047	13 3 52.6	7.957	6	23 16 15.83	1.9869	5 52 42.7	9.666
7	21 38 17.91	2.1992	12 55 53.4	8.016	7	23 18 14.94	1.9836	5 43 2.3	9.681
8	21 40 29.70	2.1937	12 47 50.7	8.073	8	23 20 13.86	1.9803	5 33 21.0	9.696
9	21 42 41.16	2.1883	12 39 44.7	8.128	9	23 22 12.58	1.9771	5 23 38.8	9.710
10	21 44 52.29	2.1828	12 31 35.4	8.183	10	23 24 11.11	1.9740	5 13 55.8	9.723
11	21 47 3.10	2.1774	12 23 22.8	8.237	11	23 26 9.46	1.9709	5 4 12.1	9.735
12	21 49 13.58	2.1720	12 15 7.0	8.289	12	23 28 7.62	1.9678	4 54 27.6	9.747
13	21 51 23.74	2.1667	12 6 48.1	8.341	13	23 30 5.60	1.9649	4 44 42.4	9.758
14	21 53 33.59	2.1614	11 58 26.1	8.391	14	23 32 3.41	1.9620	4 34 56.6	9.769
15	21 55 43.11	2.1562	11 50 1.2	8.440	15	23 34 1.04	1.9592	4 25 10.1	9.779
16	21 57 52.33	2.1510	11 41 33.3	8.489	16	23 35 58.51	1.9563	4 15 23.1	9.788
17	22 0 1.23	2.1458	11 33 2.5	8.537	17	23 37 55.80	1.9535	4 5 35.6	9.797
18	22 2 9.82	2.1407	11 24 28.9	8.583	18	23 39 52.93	1.9509	3 55 47.5	9.805
19	22 4 18.11	2.1356	11 15 52.5	8.628	19	23 41 49.91	1.9482	3 45 59.0	9.812
20	22 6 26.09	2.1304	11 7 13.5	8.673	20	23 43 46.72	1.9456	3 36 10.1	9.818
21	22 8 33.76	2.1254	10 58 31.7	8.717	21	23 45 43.38	1.9432	3 26 20.8	9.824
22	22 10 41.14	2.1204	10 49 47.4	8.760	22	23 47 39.90	1.9407	3 16 31.2	9.829
23	22 12 48.21	2.1155	10 41 0.5	8.802	23	23 49 36.27	1.9383	3 6 41.3	9.833
24	22 14 55.00	2.1107	-10 32 11.2	+8.842	24	23 51 32.50	1.9360	- 2 56 51.2	+9.837

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 15.					DECEMBER 17.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	23 51 32.50	1.9360	-2 56 51.2	+9.837	0	1 22 47.18	1.8861	+ 4 48 59.5	+9.363
1	23 53 28.59	1.9336	2 47 0.8	9.841	1	1 24 40.35	1.8862	4 58 20.6	9.339
2	23 55 24.53	1.9313	2 37 10.3	9.844	2	1 26 33.53	1.8865	5 7 40.2	9.316
3	23 57 20.35	1.9292	2 27 19.5	9.847	3	1 28 26.73	1.8868	5 16 58.5	9.292
4	23 59 16.04	1.9271	2 17 28.7	9.847	4	1 30 19.95	1.8872	5 26 15.3	9.268
5	0 1 11.60	1.9250	2 7 37.9	9.848	5	1 32 13.19	1.8876	5 35 30.6	9.243
6	0 3 7.04	1.9229	1 57 46.9	9.849	6	1 34 6.46	1.8880	5 44 44.4	9.218
7	0 5 2.35	1.9209	1 47 56.0	9.848	7	1 35 59.75	1.8884	5 53 56.7	9.192
8	0 6 57.55	1.9191	1 38 5.1	9.848	8	1 37 53.07	1.8890	6 3 7.4	9.164
9	0 8 52.64	1.9172	1 28 14.3	9.847	9	1 39 46.43	1.8896	6 12 16.4	9.137
10	0 10 47.62	1.9154	1 18 23.5	9.845	10	1 41 39.82	1.8901	6 21 23.9	9.110
11	0 12 42.49	1.9137	1 8 32.9	9.842	11	1 43 33.24	1.8907	6 30 29.6	9.082
12	0 14 37.26	1.9120	0 58 42.5	9.838	12	1 45 26.71	1.8915	6 39 33.7	9.053
13	0 16 31.93	1.9103	0 48 52.3	9.835	13	1 47 20.22	1.8922	6 48 36.0	9.024
14	0 18 26.50	1.9088	0 39 2.3	9.831	14	1 49 13.77	1.8929	6 57 36.6	8.995
15	0 20 20.98	1.9073	0 29 12.6	9.826	15	1 51 7.37	1.8937	7 6 35.4	8.964
16	0 22 15.37	1.9058	0 19 23.2	9.821	16	1 53 1.02	1.8947	7 15 32.3	8.933
17	0 24 9.67	1.9043	-0 9 34.1	9.815	17	1 54 54.73	1.8956	7 24 27.4	8.902
18	0 26 3.89	1.9030	+0 0 14.6	9.808	18	1 56 48.49	1.8965	7 33 20.6	8.871
19	0 27 58.03	1.9017	0 10 2.9	9.801	19	1 58 42.31	1.8975	7 42 11.9	8.839
20	0 29 52.09	1.9003	0 19 50.7	9.793	20	2 0 36.19	1.8985	7 51 1.3	8.807
21	0 31 46.07	1.8992	0 29 38.1	9.786	21	2 2 30.13	1.8996	7 59 48.7	8.773
22	0 33 39.99	1.8981	0 39 25.0	9.777	22	2 4 24.14	1.9007	8 8 34.0	8.739
23	0 35 33.84	1.8969	+0 49 11.3	+9.767	23	2 6 18.22	1.9018	+ 8 17 17.4	+8.705
DECEMBER 16.					DECEMBER 18.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	0 37 27.62	1.8958	+0 58 57.0	+9.757	0	2 8 12.36	1.9030	+ 8 25 58.6	+8.669
1	0 39 21.34	1.8949	1 8 42.1	9.747	1	2 10 6.58	1.9042	8 34 37.7	8.634
2	0 41 15.01	1.8940	1 18 26.6	9.736	2	2 12 0.87	1.9055	8 43 14.7	8.598
3	0 43 8.62	1.8931	1 28 10.4	9.724	3	2 13 55.24	1.9068	8 51 49.5	8.562
4	0 45 2.18	1.8922	1 37 53.5	9.712	4	2 15 49.69	1.9082	9 0 22.1	8.525
5	0 46 55.69	1.8914	1 47 35.9	9.700	5	2 17 44.22	1.9095	9 8 52.5	8.488
6	0 48 49.15	1.8907	1 57 17.5	9.687	6	2 19 38.83	1.9109	9 17 20.7	8.450
7	0 50 42.57	1.8900	2 6 58.3	9.673	7	2 21 33.53	1.9123	9 25 46.5	8.411
8	0 52 35.95	1.8894	2 16 38.3	9.659	8	2 23 28.31	1.9138	9 34 10.0	8.372
9	0 54 29.30	1.8888	2 26 17.4	9.645	9	2 25 23.19	1.9154	9 42 31.1	8.333
10	0 56 22.61	1.8883	2 35 55.7	9.630	10	2 27 18.16	1.9169	9 50 49.9	8.293
11	0 58 15.89	1.8878	2 45 33.0	9.613	11	2 29 13.22	1.9185	9 59 6.2	8.252
12	1 0 9.15	1.8874	2 55 9.3	9.597	12	2 31 8.38	1.9201	10 7 20.1	8.211
13	1 2 2.38	1.8870	3 4 44.6	9.581	13	2 33 3.63	1.9217	10 15 31.5	8.168
14	1 3 55.59	1.8867	3 14 19.0	9.564	14	2 34 58.99	1.9234	10 23 40.3	8.127
15	1 5 48.79	1.8864	3 23 52.3	9.546	15	2 36 54.44	1.9251	10 31 46.7	8.084
16	1 7 41.96	1.8862	3 33 24.5	9.527	16	2 38 50.00	1.9269	10 39 50.4	8.040
17	1 9 35.13	1.8860	3 42 55.6	9.508	17	2 40 45.67	1.9287	10 47 51.5	7.996
18	1 11 28.28	1.8858	3 52 25.5	9.489	18	2 42 41.44	1.9304	10 55 49.9	7.952
19	1 13 21.43	1.8858	4 1 54.3	9.470	19	2 44 37.32	1.9322	11 3 45.7	7.907
20	1 15 14.58	1.8858	4 11 21.9	9.449	20	2 46 33.31	1.9342	11 11 38.8	7.862
21	1 17 7.72	1.8858	4 20 48.2	9.428	21	2 48 29.42	1.9361	11 19 29.1	7.816
22	1 19 0.87	1.8858	4 30 13.3	9.407	22	2 50 25.64	1.9380	11 27 16.7	7.769
23	1 20 54.02	1.8859	4 39 37.1	9.385	23	2 52 21.98	1.9399	11 35 1.4	7.722
24	1 22 47.18	1.8861	+4 48 59.5	+9.363	24	2 54 18.43	1.9418	+11 42 43.3	+7.674

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 19.					DECEMBER 21.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	2 54 18.43	1.9418	+11 42 43.3	+7.674	0	4 30 9.55	2.0563	+16 45 40.4	+4.738
1	2 56 15.00	1.9438	11 50 22.3	7.626	1	4 32 13.00	2.0588	16 50 22.5	4.664
2	2 58 11.69	1.9459	11 57 58.4	7.577	2	4 34 16.60	2.0613	16 55 0.1	4.588
3	3 0 8.51	1.9480	12 5 31.6	7.528	3	4 36 20.36	2.0638	16 59 33.1	4.513
4	3 2 5.45	1.9500	12 13 1.8	7.478	4	4 38 24.26	2.0663	17 4 1.7	4.437
5	3 4 2.51	1.9521	12 20 28.9	7.427	5	4 40 28.31	2.0688	17 8 25.6	4.361
6	3 5 59.70	1.9542	12 27 53.0	7.377	6	4 42 32.51	2.0713	17 12 45.0	4.284
7	3 7 57.02	1.9564	12 35 14.1	7.325	7	4 44 36.86	2.0737	17 16 59.7	4.207
8	3 9 54.47	1.9586	12 42 32.0	7.273	8	4 46 41.35	2.0762	17 21 9.8	4.129
9	3 11 52.05	1.9608	12 49 46.8	7.220	9	4 48 46.00	2.0787	17 25 15.2	4.050
10	3 13 49.76	1.9630	12 56 58.4	7.167	10	4 50 50.79	2.0810	17 29 15.8	3.971
11	3 15 47.61	1.9652	13 4 6.8	7.113	11	4 52 55.72	2.0834	17 33 11.7	3.892
12	3 17 45.59	1.9675	13 11 12.0	7.059	12	4 55 0.80	2.0858	17 37 2.9	3.813
13	3 19 43.71	1.9698	13 18 13.9	7.004	13	4 57 6.02	2.0882	17 40 49.3	3.733
14	3 21 41.96	1.9720	13 25 12.5	6.918	14	4 59 11.38	2.0906	17 44 30.8	3.651
15	3 23 40.35	1.9743	13 32 7.7	6.893	15	5 1 16.89	2.0929	17 48 7.4	3.570
16	3 25 38.88	1.9767	13 38 59.6	6.837	16	5 3 22.53	2.0952	17 51 39.2	3.489
17	3 27 37.55	1.9790	13 45 48.1	6.779	17	5 5 28.32	2.0976	17 55 6.1	3.407
18	3 29 36.36	1.9813	13 52 33.1	6.722	18	5 7 34.24	2.0998	17 58 28.0	3.324
19	3 31 35.31	1.9837	13 59 14.7	6.664	19	5 9 40.30	2.1022	18 1 45.0	3.242
20	3 33 34.41	1.9862	14 5 52.8	6.605	20	5 11 46.50	2.1041	18 4 57.0	3.158
21	3 35 33.65	1.9885	14 12 27.3	6.546	21	5 13 52.83	2.1066	18 8 3.9	3.074
22	3 37 33.03	1.9909	14 18 58.3	6.486	22	5 15 59.29	2.1088	18 11 5.9	2.990
23	3 39 32.56	1.9934	+14 25 25.6	+6.425	23	5 18 5.89	2.1111	+18 14 2.7	+2.905
DECEMBER 20.					DECEMBER 22.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	3 41 32.24	1.9958	+14 31 49.3	+6.364	0	5 20 12.62	2.1133	+18 16 54.5	+2.820
1	3 43 32.06	1.9983	14 38 9.3	6.303	1	5 22 19.48	2.1153	18 19 41.1	2.734
2	3 45 32.03	2.0008	14 44 25.7	6.241	2	5 24 26.46	2.1175	18 22 22.6	2.649
3	3 47 32.15	2.0033	14 50 38.2	6.178	3	5 26 33.58	2.1197	18 24 59.0	2.563
4	3 49 32.42	2.0057	14 56 47.0	6.115	4	5 28 40.82	2.1217	18 27 30.1	2.476
5	3 51 32.83	2.0082	15 2 52.0	6.052	5	5 30 48.18	2.1238	18 29 56.1	2.389
6	3 53 33.40	2.0107	15 8 53.2	5.988	6	5 32 55.67	2.1258	18 32 16.8	2.302
7	3 55 34.11	2.0132	15 14 50.5	5.923	7	5 35 3.27	2.1278	18 34 32.3	2.214
8	3 57 34.98	2.0157	15 20 43.9	5.857	8	5 37 11.00	2.1298	18 36 42.5	2.126
9	3 59 36.00	2.0183	15 26 33.3	5.791	9	5 39 18.84	2.1317	18 38 47.4	2.037
10	4 1 37.17	2.0208	15 32 18.8	5.725	10	5 41 26.80	2.1336	18 40 46.9	1.948
11	4 3 38.49	2.0233	15 38 0.3	5.658	11	5 43 34.87	2.1354	18 42 41.1	1.859
12	4 5 39.97	2.0259	15 43 37.7	5.590	12	5 45 43.05	2.1372	18 44 30.0	1.770
13	4 7 41.60	2.0284	15 49 11.1	5.522	13	5 47 51.34	2.1391	18 46 13.5	1.679
14	4 9 43.38	2.0309	15 54 40.3	5.453	14	5 49 59.74	2.1410	18 47 51.5	1.589
15	4 11 45.31	2.0334	16 0 5.5	5.384	15	5 52 8.26	2.1428	18 49 24.2	1.500
16	4 13 47.39	2.0359	16 5 26.4	5.314	16	5 54 16.88	2.1444	18 50 51.5	1.409
17	4 15 49.62	2.0386	16 10 43.2	5.244	17	5 56 25.59	2.1461	18 52 13.3	1.318
18	4 17 52.02	2.0412	16 15 55.7	5.173	18	5 58 34.41	2.1478	18 53 29.6	1.227
19	4 19 54.56	2.0436	16 21 4.0	5.102	19	6 0 43.33	2.1495	18 54 40.5	1.135
20	4 21 57.25	2.0462	16 26 8.0	5.031	20	6 2 52.35	2.1511	18 55 45.8	1.043
21	4 24 0.10	2.0488	16 31 7.7	4.958	21	6 5 1.46	2.1526	18 56 45.6	0.951
22	4 26 3.10	2.0513	16 36 3.0	4.885	22	6 7 10.66	2.1542	18 57 39.9	0.859
23	4 28 6.25	2.0538	16 40 53.9	4.812	23	6 9 19.96	2.1557	18 58 28.7	0.767
24	4 30 9.55	2.0563	+16 45 40.4	+4.738	24	6 11 29.34	2.1571	+18 59 11.9	+0.673

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 23.					DECEMBER 25.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	6 11 29.34	2.1571	+18 59 11.9	+0.673	0	7 56 1.80	2.1850	+17 42 29.5	-3.867
1	6 13 38.81	2.1586	18 59 49.5	0.580	1	7 58 12.89	2.1818	17 38 34.7	3.959
2	6 15 48.37	2.1600	19 0 21.5	0.487	2	8 0 23.97	2.1845	17 34 34.4	4.051
3	6 17 58.01	2.1613	19 0 48.0	0.394	3	8 2 35.03	2.1841	17 30 28.6	4.143
4	6 20 7.73	2.1627	19 1 8.8	0.300	4	8 4 46.06	2.1838	17 26 17.3	4.234
5	6 22 17.53	2.1639	19 1 24.0	0.206	5	8 6 57.08	2.1834	17 22 0.5	4.326
6	6 24 27.40	2.1652	19 1 33.5	0.112	6	8 9 8.07	2.1831	17 17 38.2	4.417
7	6 26 37.35	2.1664	19 1 37.4	+0.018	7	8 11 19.05	2.1827	17 13 10.4	4.508
8	6 28 47.37	2.1677	19 1 35.7	-0.076	8	8 13 29.99	2.1822	17 8 37.3	4.598
9	6 30 57.47	2.1688	19 1 28.3	0.171	9	8 15 40.91	2.1818	17 3 58.7	4.688
10	6 33 7.63	2.1698	19 1 15.2	0.266	10	8 17 51.81	2.1813	16 59 14.7	4.778
11	6 35 17.85	2.1708	19 0 56.4	0.360	11	8 20 2.67	2.1808	16 54 25.3	4.868
12	6 37 28.13	2.1719	19 0 32.0	0.454	12	8 22 13.50	2.1803	16 49 30.6	4.957
13	6 39 38.48	2.1729	19 0 1.9	0.549	13	8 24 24.30	2.1798	16 44 30.5	5.045
14	6 41 48.88	2.1739	18 59 26.1	0.645	14	8 26 35.07	2.1792	16 39 25.2	5.133
15	6 43 59.35	2.1748	18 58 44.5	0.740	15	8 28 45.80	2.1785	16 34 14.5	5.222
16	6 46 9.86	2.1757	18 57 57.3	0.835	16	8 30 56.49	2.1779	16 28 58.6	5.309
17	6 48 20.43	2.1766	18 57 4.3	0.931	17	8 33 7.15	2.1773	16 23 37.4	5.397
18	6 50 31.05	2.1774	18 56 5.6	1.026	18	8 35 17.77	2.1767	16 18 11.0	5.483
19	6 52 41.72	2.1782	18 55 1.2	1.121	19	8 37 28.36	2.1761	16 12 39.4	5.570
20	6 54 52.43	2.1788	18 53 51.1	1.217	20	8 39 38.90	2.1754	16 7 2.6	5.657
21	6 57 3.18	2.1795	18 52 35.2	1.313	21	8 41 49.41	2.1747	16 1 20.6	5.742
22	6 59 13.97	2.1802	18 51 13.6	1.408	22	8 43 59.87	2.1740	15 55 33.6	5.827
23	7 1 24.80	2.1808	+18 49 46.3	-1.503	23	8 46 10.29	2.1733	+15 49 41.4	-5.912
DECEMBER 24.					DECEMBER 26.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	7 3 35.67	2.1814	+18 48 13.2	-1.599	0	8 48 20.67	2.1727	+15 43 44.1	-5.997
1	7 5 46.57	2.1820	18 46 34.4	1.694	1	8 50 31.01	2.1719	15 37 41.8	6.080
2	7 7 57.51	2.1825	18 44 49.9	1.790	2	8 52 41.30	2.1711	15 31 34.5	6.163
3	7 10 8.47	2.1829	18 42 59.6	1.886	3	8 54 51.54	2.1703	15 25 22.2	6.247
4	7 12 19.46	2.1834	18 41 3.6	1.981	4	8 57 1.74	2.1697	15 19 4.9	6.330
5	7 14 30.48	2.1838	18 39 1.9	2.076	5	8 59 11.90	2.1689	15 12 42.6	6.412
6	7 16 41.52	2.1842	18 36 54.5	2.171	6	9 1 22.01	2.1681	15 6 15.5	6.493
7	7 18 52.58	2.1845	18 34 41.4	2.267	7	9 3 32.07	2.1673	14 59 43.5	6.574
8	7 21 3.66	2.1848	18 32 22.5	2.362	8	9 5 42.08	2.1665	14 53 6.6	6.654
9	7 23 14.75	2.1850	18 29 58.0	2.457	9	9 7 52.05	2.1657	14 46 25.0	6.734
10	7 25 25.86	2.1853	18 27 27.7	2.552	10	9 10 1.97	2.1650	14 39 38.5	6.814
11	7 27 36.98	2.1855	18 24 51.8	2.647	11	9 12 11.85	2.1642	14 32 47.3	6.893
12	7 29 48.12	2.1857	18 22 10.1	2.742	12	9 14 21.67	2.1633	14 25 51.3	6.972
13	7 31 59.26	2.1858	18 19 22.8	2.836	13	9 16 31.44	2.1625	14 18 50.7	7.050
14	7 34 10.41	2.1858	18 16 29.8	2.931	14	9 18 41.17	2.1617	14 11 45.3	7.127
15	7 36 21.56	2.1859	18 13 31.1	3.026	15	9 20 50.85	2.1609	14 4 35.4	7.204
16	7 38 32.72	2.1859	18 10 26.7	3.120	16	9 23 0.48	2.1602	13 57 20.8	7.281
17	7 40 43.87	2.1858	18 7 16.7	3.213	17	9 25 10.07	2.1593	13 50 1.7	7.357
18	7 42 55.02	2.1858	18 4 1.1	3.307	18	9 27 19.60	2.1585	13 42 38.0	7.432
19	7 45 6.17	2.1858	18 0 39.8	3.402	19	9 29 29.09	2.1577	13 35 9.8	7.507
20	7 47 17.31	2.1857	17 57 12.9	3.495	20	9 31 38.53	2.1569	13 27 37.2	7.581
21	7 49 28.45	2.1856	17 53 40.4	3.588	21	9 33 47.92	2.1562	13 20 0.1	7.654
22	7 51 39.58	2.1853	17 50 2.4	3.681	22	9 35 57.27	2.1554	13 12 18.7	7.727
23	7 53 50.69	2.1852	17 46 18.7	3.774	23	9 38 6.57	2.1546	13 4 32.9	7.800
24	7 56 1.80	2.1850	+17 42 29.5	-3.867	24	9 40 15.82	2.1538	+12 56 42.7	-7.872

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 27.					DECEMBER 29.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	9 40 15.82	2.1538	+12 56 42.7	-7.872	0	11 23 5.93	2.1411	+5 28 42.8	-10.518
1	9 42 25.03	2.1531	12 48 48.3	7.943	1	11 25 14.41	2.1417	5 18 10.6	10.555
2	9 44 34.19	2.1523	12 40 49.6	8.013	2	11 27 22.93	2.1422	5 7 36.2	10.591
3	9 46 43.31	2.1516	12 32 46.7	8.084	3	11 29 31.47	2.1428	4 56 59.7	10.626
4	9 48 52.38	2.1508	12 24 39.5	8.153	4	11 31 40.06	2.1434	4 46 21.1	10.660
5	9 51 1.41	2.1502	12 16 28.3	8.221	5	11 33 48.68	2.1441	4 35 40.5	10.693
6	9 53 10.40	2.1495	12 8 13.0	8.289	6	11 35 57.35	2.1448	4 24 58.0	10.725
7	9 55 19.35	2.1488	11 59 53.6	8.357	7	11 38 6.06	2.1456	4 14 13.5	10.757
8	9 57 28.25	2.1481	11 51 30.1	8.424	8	11 40 14.82	2.1464	4 3 27.2	10.787
9	9 59 37.12	2.1474	11 43 2.7	8.489	9	11 42 23.63	2.1473	3 52 39.1	10.817
10	10 1 45.94	2.1468	11 34 31.4	8.555	10	11 44 32.49	2.1482	3 41 49.1	10.847
11	10 3 54.73	2.1462	11 25 56.1	8.621	11	11 46 41.41	2.1491	3 30 57.5	10.873
12	10 6 3.48	2.1456	11 17 16.9	8.685	12	11 48 50.38	2.1501	3 20 4.3	10.900
13	10 8 12.20	2.1450	11 8 33.9	8.748	13	11 50 59.42	2.1512	3 9 9.5	10.927
14	10 10 20.88	2.1443	10 59 47.1	8.811	14	11 53 8.52	2.1522	2 58 13.1	10.953
15	10 12 29.52	2.1437	10 50 56.6	8.873	15	11 55 17.68	2.1533	2 47 15.2	10.977
16	10 14 38.13	2.1433	10 42 2.3	8.934	16	11 57 26.91	2.1545	2 36 15.9	11.000
17	10 16 46.72	2.1428	10 33 4.4	8.995	17	11 59 36.22	2.1557	2 25 15.2	11.023
18	10 18 55.27	2.1423	10 24 2.9	9.056	18	12 1 45.60	2.1570	2 14 13.1	11.045
19	10 21 3.79	2.1418	10 14 57.7	9.116	19	12 3 55.06	2.1583	2 3 9.8	11.065
20	10 23 12.29	2.1414	10 5 49.0	9.174	20	12 6 4.60	2.1597	1 52 5.3	11.085
21	10 25 20.76	2.1409	9 56 36.8	9.232	21	12 8 14.22	2.1611	1 40 59.6	11.103
22	10 27 29.20	2.1406	9 47 21.1	9.290	22	12 10 23.93	2.1625	1 29 52.9	11.122
23	10 29 37.63	2.1402	+ 9 38 2.0	-9.347	23	12 12 33.72	2.1640	+1 18 45.0	-11.139
DECEMBER 28.					DECEMBER 30.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	10 31 46.03	2.1398	+ 9 28 39.5	-9.403	0	12 14 43.61	2.1656	+1 7 36.2	-11.154
1	10 33 54.41	2.1395	9 19 13.7	9.458	1	12 16 53.59	2.1672	0 56 26.5	11.170
2	10 36 2.77	2.1392	9 9 44.6	9.512	2	12 19 3.67	2.1688	0 45 15.8	11.184
3	10 38 11.12	2.1390	9 0 12.2	9.566	3	12 21 13.85	2.1705	0 34 4.4	11.197
4	10 40 19.45	2.1388	8 50 36.7	9.619	4	12 23 24.13	2.1723	0 22 52.2	11.209
5	10 42 27.77	2.1385	8 40 57.9	9.672	5	12 25 34.52	2.1741	0 11 39.3	11.221
6	10 44 36.07	2.1383	8 31 16.1	9.723	6	12 27 45.02	2.1759	+0 0 25.7	11.231
7	10 46 44.37	2.1382	8 21 31.2	9.774	7	12 29 55.63	2.1778	-0 10 48.4	11.239
8	10 48 52.66	2.1382	8 11 43.2	9.824	8	12 32 6.36	2.1798	0 22 3.0	11.247
9	10 51 0.95	2.1381	8 1 52.3	9.873	9	12 34 17.20	2.1818	0 33 18.1	11.255
10	10 53 9.23	2.1379	7 51 58.5	9.921	10	12 36 28.17	2.1838	0 44 33.6	11.262
11	10 55 17.50	2.1379	7 42 1.8	9.969	11	12 38 39.25	2.1858	0 55 49.5	11.267
12	10 57 25.78	2.1380	7 32 2.2	10.017	12	12 40 50.47	2.1881	1 7 5.6	11.270
13	10 59 34.06	2.1381	7 21 59.8	10.063	13	12 43 1.82	2.1902	1 18 21.9	11.274
14	11 1 42.35	2.1382	7 11 54.7	10.108	14	12 45 13.29	2.1924	1 29 38.5	11.277
15	11 3 50.64	2.1383	7 1 46.9	10.153	15	12 47 24.91	2.1947	1 40 55.1	11.277
16	11 5 58.94	2.1384	6 51 36.4	10.197	16	12 49 36.66	2.1971	1 52 11.7	11.276
17	11 8 7.25	2.1386	6 41 23.3	10.239	17	12 51 48.56	2.1994	2 3 28.2	11.275
18	11 10 15.57	2.1388	6 31 7.7	10.282	18	12 54 0.59	2.2018	2 14 44.7	11.273
19	11 12 23.91	2.1392	6 20 49.5	10.323	19	12 56 12.78	2.2044	2 26 1.0	11.270
20	11 14 32.27	2.1395	6 10 28.9	10.363	20	12 58 25.12	2.2063	2 37 17.1	11.266
21	11 16 40.65	2.1398	6 0 5.9	10.403	21	13 0 37.61	2.2094	2 48 32.9	11.260
22	11 18 49.05	2.1402	5 49 40.5	10.442	22	13 2 50.25	2.2120	2 59 48.3	11.253
23	11 20 57.48	2.1407	5 39 12.8	10.481	23	13 5 3.05	2.2147	3 11 3.3	11.246
24	11 23 5.93	2.1411	+ 5 28 42.8	-10.518	24	13 7 16.02	2.2175	-3 22 17.8	-11.238

GREENWICH MEAN TIME.

Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.	Hour.	Right Ascension.	Var. per Min.	Declination.	Var. per Min.
DECEMBER 31.					DECEMBER 31.				
	h m s	s	° ' "	"		h m s	s	° ' "	"
0	13 7 16.02	2.2175	-3 22 17.8	-11.238	12	13 34 5.22	2.2537	-5 36 9.2	-11.044
1	13 9 29.15	2.2203	3 33 31.8	11.228	13	13 36 20.54	2.2569	5 47 11.2	11.021
2	13 11 42.45	2.2230	3 44 45.1	11.216	14	13 38 36.05	2.2603	5 58 11.7	10.996
3	13 13 55.91	2.2258	3 55 57.7	11.204	15	13 40 51.77	2.2637	6 9 10.7	10.969
4	13 16 9.55	2.2288	4 7 9.6	11.192	16	13 43 7.69	2.2671	6 20 8.0	10.942
5	13 18 23.37	2.2318	4 18 20.7	11.178	17	13 45 23.82	2.2706	6 31 3.7	10.914
6	13 20 37.37	2.2348	4 29 30.9	11.162	18	13 47 40.16	2.2741	6 41 57.7	10.884
7	13 22 51.54	2.2378	4 40 40.1	11.145	19	13 49 56.71	2.2776	6 52 49.8	10.853
8	13 25 5.90	2.2408	4 51 48.3	11.127	20	13 52 13.47	2.2812	7 3 40.0	10.821
9	13 27 20.44	2.2440	5 2 55.3	11.108	21	13 54 30.45	2.2848	7 14 28.3	10.788
10	13 29 35.18	2.2472	5 14 1.2	11.088	22	13 56 47.65	2.2884	7 25 14.5	10.753
11	13 31 50.10	2.2503	5 25 5.9	11.067	23	13 59 5.06	2.2921	7 35 58.6	10.717
12	13 34 5.22	2.2537	-5 36 9.2	-11.044	24	14 1 22.70	2.2959	-7 46 40.5	-10.680

PHASES OF THE MOON.

	d h m	d h m	d h m	d h m
○ Full Moon	Jan. 2 14 33.4	Apr. 1 1 9.8	June 28 1 4.2	Sept. 24 13 15.8
☾ Last Quarter	9 12 54.5	7 17 22.5	July 5 13 56.4	Oct. 2 17 29.2
● New Moon	16 14 41.0	15 18 28.4	13 12 44.8	9 18 5.5
☾ First Quarter	24 15 59.3	23 17 20.3	20 13 31.9	16 8 53.6
○ Full Moon	Feb. 1 3 53.2	30 9 30.3	27 10 32.6	24 6 26.2
☾ Last Quarter	7 21 15.9	May 7 6 18.2	Aug. 4 7 22.3	Nov. 1 8 48.9
● New Moon	15 7 7.2	15 10 38.4	11 23 16.6	8 3 27.0
☾ First Quarter	23 12 6.2	23 2 25.0	18 18 6.9	14 21 41.1
○ Full Moon	Mar. 2 15 23.6	29 17 7.2	25 22 29.4	23 0 57.9
☾ Last Quarter	9 6 31.0	June 5 21 19.1	Sept. 3 0 47.3	30 22 9.2
● New Moon	17 0 51.3	14 0 42.1	10 8 52.6	Dec. 7 13 30.4
☾ First Quarter	25 4 41.5	21 8 45.9	17 0 4.0	14 14 37.9
○ Full Moon	Apr. 1 1 9.8	28 1 4.2	24 13 15.8	22 19 33.0
☾ Last Quarter	7 17 22.5	July 5 13 56.4	Oct. 2 17 29.2	30 9 7.1

APOGEE.

	d h	d h
January	23 1.4	August 3 18.4
February	19 20.3	August 31 12.9
March	19 8.4	September 28 5.4
April	15 11.2	October 25 14.6
May	12 16.8	November 21 14.9
June	9 6.5	December 18 23.2
July	6 23.8	

PERIGEE.

	d h	d h
January	7 23.9	July 21 13.9
February	3 19.3	August 15 22.0
March	3 22.8	September 12 10.4
April	1 9.4	October 10 15.7
April	29 20.4	November 8 3.0
May	28 3.8	December 6 15.0
June	25 1.5	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d	Jan.		h m	m	
Jan.	1.0	80 17 15.7	-5 1 2.7	15 27.8	56 39.72	+1.629	14.0	1	U	11 2.4	2.23	
	1.5	86 52 8.6	5 1 3.4	15 33.1	56 59.20	1.613	14.5	1	L	23 29.3	2.26	
	2.0	93 31 39.5	4 56 59.1	15 38.3	57 18.32	1.568	15.0	2	U	11 56.6	2.28	
	2.5	100 15 32.4	4 48 45.0	15 43.4	57 36.72	1.495	15.5			.....	...
	3.0	107 3 26.7	4 36 20.3	15 48.1	57 54.10	1.397	16.0	3	L	0 24.1	2.30	
	3.5	113 54 57.1	-4 19 49.4	15 52.5	58 10.17	+1.279	16.5	3	U	12 51.7	2.30	
	4.0	120 49 35.9	3 59 21.2	15 56.4	58 24.72	1.143	17.0	4	L	1 19.2	2.29	
	4.5	127 46 53.6	3 35 10.4	15 59.9	58 37.56	0.996	17.5	4	U	13 46.6	2.28	
	5.0	134 46 20.1	3 7 36.0	16 2.9	58 48.59	0.842	18.0	5	L	2 13.8	2.26	
	5.5	141 47 26.9	2 37 2.1	16 5.4	58 57.75	0.685	18.5	5	U	14 40.8	2.24	
	6.0	148 49 46.9	-2 3 56.6	16 7.4	59 5.05	+0.532	19.0	6	L	3 7.5	2.21	
	6.5	155 52 56.5	1 28 50.6	16 8.9	59 10.53	0.383	19.5	6	U	15 33.9	2.19	
	7.0	162 56 34.7	0 52 17.7	16 9.9	59 14.28	0.244	20.0	7	L	4 0.1	2.18	
	7.5	170 0 24.7	-0 14 53.4	16 10.5	59 16.43	+0.115	20.5	7	U	16 26.1	2.16	
	8.0	177 4 13.0	+0 22 46.3	16 10.7	59 17.09	-0.004	21.0	8	L	4 51.9	2.15	
	8.5	184 7 49.2	+1 0 5.2	16 10.5	59 16.39	-0.111	21.5	8	U	17 17.7	2.15	
	9.0	191 11 5.0	1 36 27.9	16 10.0	59 14.47	0.208	22.0	9	L	5 43.6	2.16	
	9.5	198 13 54.0	2 11 20.0	16 9.2	59 11.42	0.299	22.5	9	U	18 9.5	2.17	
	10.0	205 16 10.5	2 44 9.4	16 8.0	59 7.32	0.383	23.0	10	L	6 35.6	2.19	
	10.5	212 17 48.5	3 14 25.8	16 6.7	59 2.24	0.464	23.5	10	U	19 2.0	2.21	
	11.0	219 18 40.8	+3 41 42.1	16 5.0	58 56.19	-0.545	24.0	11	L	7 28.6	2.23	
	11.5	226 18 39.1	4 5 34.2	16 3.1	58 49.17	0.625	24.5	11	U	19 55.5	2.26	
	12.0	233 17 32.0	4 25 41.8	16 0.9	58 41.19	0.706	25.0	12	L	8 22.7	2.28	
	12.5	240 15 5.9	4 41 48.5	15 58.5	58 32.21	0.790	25.5	12	U	20 50.1	2.29	
	13.0	247 11 4.8	4 53 41.9	15 55.7	58 22.21	0.877	26.0	13	L	9 17.7	2.31	
	13.5	254 5 10.1	+5 1 14.6	15 52.7	58 11.16	-0.964	26.5	13	U	21 45.4	2.31	
	14.0	260 57 1.3	5 4 23.4	15 49.4	57 59.07	1.050	27.0	14	L	10 13.0	2.30	
	14.5	267 46 17.2	5 3 9.9	15 45.9	57 45.97	1.133	27.5	14	U	22 40.5	2.29	
	15.0	274 32 35.9	4 57 40.2	15 42.0	57 31.90	1.210	28.0	15	L	11 7.8	2.26	
	15.5	281 15 36.6	4 48 4.7	15 38.0	57 16.96	1.278	28.5	15	U	23 34.6	2.22	
	16.0	287 55 0.2	+4 34 37.5	15 33.7	57 1.28	-1.333	29.0	16	L	12 1.0	2.18	
	16.5	294 30 30.1	4 17 35.9	15 29.3	56 45.02	1.374	29.5			.....	...
	17.0	301 1 53.9	3 57 20.1	15 24.7	56 28.38	1.395	0.4	17	U	0 26.8	2.13	
	17.5	307 29 2.8	3 34 11.9	15 20.2	56 11.61	1.397	0.9	17	L	12 52.0	2.08	
	18.0	313 51 53.1	3 8 34.8	15 15.6	55 54.94	1.378	1.4	18	U	1 16.6	2.02	
	18.5	320 10 26.2	+2 40 52.4	15 11.2	55 38.64	-1.335	1.9	18	L	13 40.6	1.97	
	19.0	326 24 48.5	2 11 29.2	15 6.9	55 23.00	1.268	2.4	19	U	2 4.0	1.93	
	19.5	332 35 11.6	1 40 48.3	15 2.9	55 8.29	1.180	2.9	19	L	14 26.9	1.88	
	20.0	338 41 51.8	1 9 13.1	14 59.2	54 54.78	1.069	3.4	20	U	2 49.2	1.84	
	20.5	344 45 10.3	0 37 5.3	14 55.9	54 42.73	0.936	3.9	20	L	15 11.2	1.82	
	21.0	350 45 32.0	+0 4 45.7	14 53.1	54 32.40	-0.784	4.4	21	U	3 32.8	1.79	
	21.5	356 43 26.1	-0 27 26.0	14 50.8	54 23.98	0.615	4.9	21	L	15 54.2	1.77	
	22.0	2 39 24.1	0 59 11.1	14 49.1	54 17.70	0.430	5.4	22	U	4 15.4	1.76	
	22.5	8 34 1.4	1 30 12.3	14 48.0	54 13.71	0.233	5.9	22	L	16 36.5	1.76	
	23.0	14 27 54.7	2 0 12.8	14 47.6	54 12.14	-0.026	6.4	23	U	4 57.7	1.77	
	23.5	20 21 42.6	-2 28 56.5	14 47.9	54 13.11	+0.189	6.9	23	L	17 19.0	1.78	
	24.0	26 16 5.1	-2 56 7.9	14 48.8	54 16.70	+0.409	7.4	24	U	5 40.5	1.80	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ' "	° ' "	' "	' "	"	d		h m	m	
Jan. 24.0	26 16 5.1	-2 56 7.9	14 48.8	54 16.70	+0.409	7.4	Jan. 24	U 5 40.5	1.80	
24.5	32 11 42.4	3 21 31.6	14 50.5	54 22.92	0.628	7.9	24	L 18 2.3	1.83	
25.0	38 9 14.9	3 44 52.2	14 53.0	54 31.77	0.847	8.4	25	U 6 24.5	1.87	
25.5	44 9 22.3	4 5 54.7	14 56.1	54 43.22	1.060	8.9	25	L 18 47.2	1.91	
26.0	50 12 43.2	4 24 23.7	14 59.9	54 57.17	1.262	9.4	26	U 7 10.4	1.96	
26.5	56 19 53.7	-4 40 3.5	15 4.3	55 13.46	+1.451	9.9	26	L 19 34.2	2.01	
27.0	62 31 27.2	4 52 38.7	15 9.3	55 31.92	1.622	10.4	27	U 7 58.6	2.06	
27.5	68 47 53.6	5 1 54.2	15 14.9	55 52.30	1.770	10.9	27	L 20 23.6	2.11	
28.0	75 9 37.8	5 7 35.2	15 20.9	56 14.29	1.890	11.4	28	U 8 49.3	2.17	
28.5	81 36 59.2	5 9 28.3	15 27.2	56 37.53	1.979	11.9	28	L 21 15.6	2.21	
29.0	88 10 11.0	-5 7 21.4	15 33.8	57 1.63	+2.031	12.4	29	U 9 42.4	2.25	
29.5	94 49 19.2	5 1 5.2	15 40.5	57 26.11	2.013	12.9	29	L 22 9.7	2.29	
30.0	101 34 21.9	4 50 33.5	15 47.1	57 50.50	2.013	13.4	30	U 10 37.4	2.31	
30.5	108 25 9.1	4 35 44.1	15 53.6	58 14.25	1.938	13.9	30	L 23 5.2	2.33	
31.0	115 21 22.7	4 16 40.0	15 59.7	58 36.85	1.821	14.4	31	U 11 33.2	2.33	
Feb. 31.5	122 22 37.0	-3 53 29.6	16 5.4	58 57.79	+1.662	14.9		.....	...
Feb. 1.0	129 28 19.1	3 26 27.4	16 10.6	59 16.58	1.464	15.4	Feb. 1	L 0 1.2	2.34	
1.5	136 37 50.3	2 55 54.6	16 15.0	59 32.80	1.234	15.9	1	U 12 29.2	2.32	
2.0	143 50 27.2	2 22 18.0	16 18.6	59 46.11	0.980	16.4	2	L 0 56.9	2.30	
2.5	151 5 23.7	1 46 10.3	16 21.4	59 56.26	0.710	16.9	2	U 13 24.5	2.29	
3.0	158 21 52.9	-1 8 8.7	16 23.2	60 3.13	+0.434	17.4	3	L 1 51.8	2.27	
3.5	165 39 8.2	-0 28 53.7	16 24.2	60 6.68	+0.160	17.9	3	U 14 18.9	2.25	
4.0	172 56 25.3	+0 10 52.2	16 24.3	60 7.01	-0.103	18.4	4	L 2 45.8	2.23	
4.5	180 13 3.6	0 50 25.7	16 23.6	60 4.28	0.347	18.9	4	U 15 12.5	2.22	
5.0	187 28 26.8	1 29 5.2	16 22.1	59 58.77	0.568	19.4	5	L 3 39.2	2.22	
5.5	194 42 3.6	+2 6 10.3	16 19.9	59 50.80	-0.757	19.9	5	U 16 5.7	2.21	
6.0	201 53 28.2	2 41 4.6	16 17.1	59 40.72	0.918	20.4	6	L 4 32.3	2.22	
6.5	209 2 20.0	3 13 15.4	16 13.9	59 28.90	1.047	20.9	6	U 16 58.9	2.22	
7.0	216 8 23.1	3 42 14.4	16 10.3	59 15.70	1.147	21.4	7	L 5 25.6	2.23	
7.5	223 11 25.8	4 7 38.3	16 6.4	59 1.47	1.220	21.9	7	U 17 52.4	2.24	
8.0	230 11 20.4	+4 29 8.2	16 2.4	58 46.50	-1.270	22.4	8	L 6 19.3	2.25	
8.5	237 8 1.7	4 46 30.4	15 58.2	58 31.06	1.300	22.9	8	U 18 46.4	2.26	
9.0	244 1 26.7	4 59 35.2	15 53.9	58 15.36	1.314	23.4	9	L 7 13.5	2.26	
9.5	250 51 33.9	5 8 17.5	15 49.6	57 59.57	1.315	23.9	9	U 19 40.7	2.26	
10.0	257 38 22.8	5 12 36.5	15 45.3	57 43.83	1.308	24.4	10	L 8 7.8	2.26	
10.5	264 21 53.5	+5 12 34.5	15 41.0	57 28.20	-1.295	24.9	10	U 20 34.9	2.25	
11.0	271 2 5.6	5 8 17.9	15 36.8	57 12.76	1.278	25.4	11	L 9 1.7	2.22	
11.5	277 38 59.6	4 59 56.0	15 32.7	56 57.53	1.259	25.9	11	U 21 28.2	2.20	
12.0	284 12 35.3	4 47 40.9	15 28.6	56 42.55	1.239	26.4	12	L 9 54.4	2.16	
12.5	290 42 52.8	4 31 47.7	15 24.6	56 27.81	1.217	26.9	12	U 22 20.1	2.12	
13.0	297 9 51.9	+4 12 33.6	15 20.6	56 13.36	-1.192	27.4	13	L 10 45.3	2.08	
13.5	303 33 33.5	3 50 17.7	15 16.8	55 59.21	1.166	27.9	13	U 23 10.0	2.04	
14.0	309 53 58.9	3 25 20.7	15 13.0	55 45.39	1.135	28.4	14	L 11 34.2	2.00	
14.5	316 11 10.6	2 58 4.8	15 9.4	55 31.98	1.100	28.9	14	U 23 57.9	1.95	
15.0	322 25 12.1	2 28 52.6	15 5.8	55 19.03	1.057	29.4	15	L 12 21.0	1.91	
15.5	328 36 9.0	+1 58 7.3	15 2.5	55 6.66	-1.003	0.2		.....	..
16.0	334 44 8.8	+1 26 12.4	14 59.3	54 54.99	-0.940	0.7	16	U 0 43.7	1.87	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
Feb.	16.0	334 44 8.8	+1 26 12.4	14 59.3	54 54.99	-0.940	0.7	Feb. 16	U	0 43.7	1.87
	16.5	340 49 21.4	0 53 30.7	14 56.3	54 44.14	0.885	1.2	16	L	13 6.0	1.85
	17.0	346 51 58.7	+0 20 24.8	14 53.6	54 34.28	0.777	1.7	17	U	1 28.0	1.82
	17.5	352 52 15.5	-0 12 43.6	14 51.3	54 25.55	0.675	2.2	17	L	13 49.6	1.79
	18.0	358 50 29.2	0 45 33.8	14 49.2	54 18.14	0.558	2.7	18	U	2 11.0	1.78
	18.5	4 46 59.8	-1 17 46.1	14 47.6	54 12.22	-0.428	3.2	18	L	14 32.3	1.77
	19.0	10 42 10.0	1 49 1.8	14 46.5	54 7.97	0.280	3.7	19	U	2 53.5	1.76
	19.5	16 36 24.8	2 19 3.3	14 45.8	54 5.55	-0.120	4.2	19	L	15 14.7	1.77
	20.0	22 30 12.0	2 47 34.1	14 45.7	54 5.14	+0.053	4.7	20	U	3 36.1	1.79
	20.5	28 24 1.3	3 14 18.4	14 46.2	54 6.87	0.237	5.2	20	L	15 57.6	1.80
	21.0	34 18 24.3	-3 39 1.3	14 47.3	54 10.88	+0.432	5.7	21	U	4 19.3	1.82
	21.5	40 13 54.7	4 1 28.5	14 49.0	54 17.28	0.634	6.2	21	L	16 41.3	1.85
	22.0	46 11 7.2	4 21 26.2	14 51.4	54 26.13	0.842	6.7	22	U	5 3.8	1.89
	22.5	52 10 37.7	4 38 40.8	14 54.5	54 37.51	1.053	7.2	22	L	17 26.6	1.92
	23.0	58 13 2.3	4 52 59.1	14 58.3	54 51.41	1.263	7.7	23	U	5 50.0	1.97
	23.5	64 18 57.2	-5 4 8.3	15 2.8	55 7.80	+1.468	8.2	23	L	18 13.9	2.02
	24.0	70 28 57.9	5 11 55.9	15 7.9	55 26.60	1.664	8.7	24	U	6 38.4	2.07
	24.5	76 43 38.4	5 16 9.4	15 13.6	55 47.68	1.847	9.2	24	L	19 3.5	2.11
	25.0	83 3 30.3	5 16 37.7	15 19.9	56 10.84	2.010	9.7	25	U	7 29.1	2.16
	25.5	89 29 1.8	5 13 10.5	15 26.8	56 35.82	2.148	10.2	25	L	19 55.3	2.20
	26.0	96 0 37.0	-5 5 39.3	15 34.0	57 2.26	+2.254	10.7	26	U	8 21.9	2.24
	26.5	102 38 34.4	4 53 57.7	15 41.5	57 29.77	2.324	11.2	26	L	20 49.0	2.27
	27.0	109 23 5.9	4 38 2.6	15 49.1	57 57.86	2.350	11.7	27	U	9 16.4	2.30
	27.5	116 14 15.9	4 17 55.1	15 56.8	58 25.97	2.326	12.2	27	L	21 44.1	2.31
	28.0	123 12 0.3	3 53 40.7	16 4.3	58 53.47	2.249	12.7	28	U	10 11.9	2.33
	28.5	130 16 5.7	-3 25 31.1	16 11.4	59 19.73	+2.117	13.2	28	L	22 39.9	2.33
Mar.	1.0	137 26 9.3	2 53 44.3	16 18.0	59 44.06	1.929	13.7	Mar. 1	U	11 7.8	2.33
	1.5	144 41 38.5	2 18 45.2	16 24.0	60 5.81	1.688	14.2	1	L	23 35.8	2.33
	2.0	152 1 51.8	1 41 5.2	16 29.0	60 24.37	1.398	14.7	2	U	12 3.6	2.32
	2.5	159 25 59.7	1 1 22.5	16 33.1	60 39.20	1.069	15.2			.....	...
	3.0	166 53 6.0	-0 20 20.3	16 36.0	60 49.91	+0.711	15.7	3	L	0 31.4	2.32
	3.5	174 22 10.0	+0 21 14.6	16 37.7	60 56.21	+0.337	16.2	3	U	12 59.2	2.31
	4.0	181 52 8.3	1 2 32.7	16 38.2	60 58.00	-0.038	16.7	4	L	1 26.8	2.30
	4.5	189 21 57.5	1 42 45.4	16 37.5	60 55.35	0.401	17.2	4	U	13 54.5	2.30
	5.0	196 50 36.1	2 21 5.8	16 35.6	60 48.47	0.741	17.7	5	L	2 22.1	2.30
	5.5	204 17 6.9	+2 56 51.0	16 32.7	60 37.71	-1.046	18.2	5	U	14 49.8	2.31
	6.0	211 40 38.5	3 29 23.6	16 28.8	60 23.54	1.308	18.7	6	L	3 17.5	2.31
	6.5	219 0 26.5	3 58 12.4	16 24.2	60 6.50	1.524	19.2	6	U	15 45.2	2.31
	7.0	226 15 54.9	4 22 53.4	16 18.9	59 47.15	1.692	19.7	7	L	4 13.0	2.32
	7.5	233 26 35.7	4 43 9.3	16 13.2	59 26.08	1.812	20.2	7	U	16 40.8	2.32
	8.0	240 32 9.4	+4 58 49.6	16 7.1	59 3.85	-1.887	20.7	8	L	5 8.6	2.31
	8.5	247 32 23.8	5 9 49.9	16 0.9	58 40.96	1.920	21.2	8	U	17 36.3	2.30
	9.0	254 27 14.5	5 16 10.9	15 54.6	58 17.90	1.919	21.7	9	L	6 3.9	2.29
	9.5	261 16 42.6	5 17 57.8	15 48.3	57 55.03	1.888	22.2	9	U	18 31.2	2.28
	10.0	268 0 54.4	5 15 19.6	15 42.3	57 32.68	1.833	22.7	10	L	6 58.2	2.24
	10.5	274 40 0.5	+5 8 28.4	15 36.4	57 11.11	-1.760	23.2	10	U	19 24.9	2.21
	11.0	281 14 14.6	+4 57 38.7	15 30.8	56 50.49	-1.674	23.7	11	L	7 51.2	2.17

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	° ' "	° ' "	' "	' "	"	d			h m	m	
Mar. 10.0	268 0 54.4	+5 15 19.6	15 42.3	57 32.68	-1.833	22.7	Mar. 10	L	6 58.2	2.24	
10.5	274 40 0.5	5 8 28.4	15 36.4	57 11.11	1.760	23.2	10	U	19 24.9	2.21	
11.0	281 14 14.6	4 57 38.7	15 30.8	56 50.49	1.674	23.7	11	L	7 51.2	2.17	
11.5	287 43 52.4	4 43 6.6	15 25.4	56 30.96	1.580	24.2	11	U	20 16.9	2.12	
12.0	294 9 11.3	4 25 9.9	15 20.4	56 12.60	1.480	24.7	12	L	8 42.2	2.08	
12.5	300 30 29.3	+4 4 7.7	15 15.8	55 55.45	-1.378	25.2	12	U	21 6.9	2.04	
13.0	306 48 4.6	3 40 19.7	15 11.4	55 39.53	1.276	25.7	13	L	9 31.1	2.00	
13.5	313 2 15.3	3 14 6.5	15 7.4	55 24.82	1.176	26.2	13	U	21 54.8	1.95	
14.0	319 13 19.0	2 45 49.2	15 3.7	55 11.30	1.078	26.7	14	L	10 18.0	1.91	
14.5	325 21 32.8	2 15 49.1	15 0.4	54 58.93	0.982	27.2	14	U	22 40.7	1.88	
15.0	331 27 13.1	+1 44 28.1	14 57.3	54 47.71	-0.889	27.7	15	L	11 3.1	1.85	
15.5	337 30 35.5	1 12 7.9	14 54.5	54 37.59	0.797	28.2	15	U	23 25.1	1.82	
16.0	343 31 55.3	0 39 10.1	14 52.1	54 28.57	0.706	28.7	16	L	11 46.8	1.80	
16.5	349 31 27.3	+0 5 56.3	14 49.9	54 20.65	0.614	29.2			.....	...
17.0	355 29 26.0	-0 27 12.5	14 48.1	54 13.85	0.520	0.0	17	U	0 8.3	1.78	
17.5	1 26 6.3	-0 59 55.8	14 46.5	54 8.19	-0.422	0.5	17	L	12 29.6	1.77	
18.0	7 21 43.1	1 31 53.7	14 45.3	54 3.75	0.317	1.0	18	U	0 50.8	1.77	
18.5	13 16 31.9	2 2 47.2	14 44.5	54 0.60	0.207	1.5	18	L	13 12.0	1.77	
19.0	19 10 49.2	2 32 18.2	14 44.0	53 58.81	-0.089	2.0	19	U	1 33.3	1.78	
19.5	25 4 52.8	3 0 9.5	14 43.9	53 58.50	+0.039	2.5	19	L	13 54.7	1.79	
20.0	30 59 1.2	-3 26 5.0	14 44.2	53 59.77	+0.175	3.0	20	U	2 16.2	1.80	
20.5	36 53 34.8	3 49 49.4	14 45.0	54 2.73	0.321	3.5	20	L	14 38.0	1.83	
21.0	42 48 55.4	4 11 8.7	14 46.3	54 7.51	0.477	4.0	21	U	3 0.1	1.85	
21.5	48 45 26.4	4 29 49.6	14 48.2	54 14.22	0.642	4.5	21	L	15 22.5	1.88	
22.0	54 43 33.0	4 45 39.8	14 50.6	54 22.96	0.816	5.0	22	U	3 45.3	1.92	
22.5	60 43 41.8	-4 58 27.8	14 53.5	54 33.83	+0.996	5.5	22	L	16 8.6	1.96	
23.0	66 46 21.0	5 8 2.9	14 57.1	54 46.88	1.181	6.0	23	U	4 32.3	1.99	
23.5	72 51 59.9	5 14 15.3	15 1.2	55 2.18	1.369	6.5	23	L	16 56.4	2.03	
24.0	79 1 8.9	5 16 55.8	15 6.0	55 19.74	1.556	7.0	24	U	5 21.0	2.07	
24.5	85 14 18.7	5 15 56.4	15 11.4	55 39.50	1.738	7.5	24	L	17 46.0	2.10	
25.0	91 31 59.8	-5 11 10.3	15 17.4	56 1.41	+1.911	8.0	25	U	6 11.5	2.14	
25.5	97 54 42.1	5 2 31.8	15 23.9	56 25.31	2.070	8.5	25	L	18 37.4	2.17	
26.0	104 22 54.0	4 49 57.3	15 30.9	56 51.00	2.207	9.0	26	U	7 3.6	2.20	
26.5	110 57 0.9	4 33 25.2	15 38.3	57 18.19	2.319	9.5	26	L	19 30.1	2.22	
27.0	117 37 24.8	4 12 57.0	15 46.0	57 46.53	2.397	10.0	27	U	7 56.9	2.24	
27.5	124 24 22.7	-3 48 38.0	15 53.9	58 15.55	+2.433	10.5	27	L	20 23.9	2.26	
28.0	131 18 5.4	3 20 37.7	16 1.9	58 44.73	2.421	11.0	28	U	8 51.1	2.27	
28.5	138 18 36.0	2 49 10.8	16 9.7	59 13.45	2.356	11.5	28	L	21 18.4	2.28	
29.0	145 25 49.1	2 14 37.8	16 17.2	59 41.04	2.231	12.0	29	U	9 45.8	2.29	
29.5	152 39 29.1	1 37 25.5	16 24.2	60 6.76	2.046	12.5	29	L	22 13.3	2.30	
30.0	159 59 10.0	-0 58 7.2	16 30.5	60 29.90	+1.800	13.0	30	U	10 40.9	2.31	
30.5	167 24 14.6	-0 17 22.3	16 35.9	60 49.73	1.496	13.5	30	L	23 8.7	2.32	
31.0	174 53 55.3	+0 24 4.4	16 40.3	61 5.61	1.143	14.0	31	U	11 36.6	2.33	
31.5	182 27 13.8	1 5 24.4	16 43.4	61 17.01	0.750	14.5			.....	...
Apr. 1.0	190 3 3.9	1 45 46.9	16 45.1	61 23.52	+0.332	15.0	Apr. 1	L	0 4.6	2.35	
1.5	197 40 13.3	+2 24 21.5	16 45.5	61 24.95	-0.094	15.5	1	U	12 32.9	2.36	
2.0	205 17 25.7	+3 0 20.0	16 44.5	61 21.28	-0.515	16.0	2	L	1 1.3	2.37	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m	
Apr.	1.0	190 3 3.9	+1 45 46.9	16 45.1	61 23.52	+0.332	15.0	Apr.	1	L	0 4.6	2.35
	1.5	197 40 13.3	2 24 21.5	16 45.5	61 24.95	-0.094	15.5		1	U	12 32.9	2.36
	2.0	205 17 25.7	3 0 20.0	16 44.5	61 21.28	0.515	16.0		2	L	1 1.3	2.37
	2.5	212 53 24.7	3 32 59.1	16 42.2	61 12.68	0.913	16.5		2	U	13 29.9	2.39
	3.0	220 26 56.6	4 1 42.3	16 38.6	60 59.50	1.276	17.0		3	L	1 58.7	2.40
	3.5	227 56 53.1	+4 26 0.4	16 33.9	60 42.25	-1.590	17.5		3	U	14 27.6	2.41
	4.0	235 22 14.0	4 45 33.5	16 28.3	60 21.55	1.851	18.0		4	L	2 56.5	2.41
	4.5	242 42 9.4	5 0 9.6	16 21.9	59 58.06	2.053	18.5		4	U	15 25.5	2.41
	5.0	249 56 0.3	5 9 45.1	16 14.9	59 32.52	2.196	19.0		5	L	3 54.3	2.39
	5.5	257 3 19.2	5 14 23.4	16 7.6	59 5.59	2.282	19.5		5	U	16 22.8	2.36
	6.0	264 3 50.2	+5 14 13.8	16 0.0	58 37.96	-2.316	20.0		6	L	4 51.0	2.33
	6.5	270 57 27.7	5 9 30.4	15 52.5	58 10.20	2.303	20.5		6	U	17 18.8	2.30
	7.0	277 44 15.6	5 0 30.5	15 45.0	57 42.84	2.251	21.0		7	L	5 46.1	2.25
	7.5	284 24 25.9	4 47 33.9	15 37.8	57 16.31	2.166	21.5		7	U	18 12.7	2.19
	8.0	290 58 16.8	4 31 1.8	15 30.9	56 50.96	2.055	22.0		8	L	6 38.7	2.14
	8.5	297 26 12.0	+4 11 16.2	15 24.4	56 27.06	-1.925	22.5		8	U	19 4.1	2.09
	9.0	303 48 38.6	3 48 39.3	15 18.3	56 4.81	1.781	23.0		9	L	7 28.8	2.03
	9.5	310 6 6.1	3 23 33.5	15 12.7	55 44.35	1.628	23.5		9	U	19 52.9	1.98
	10.0	316 19 5.5	2 56 20.6	15 7.7	55 25.75	1.471	24.0		10	L	8 16.3	1.93
	10.5	322 28 8.1	2 27 22.1	15 3.1	55 9.04	1.313	24.5		10	U	20 39.3	1.90
	11.0	328 33 45.0	+1 56 59.3	14 59.1	54 54.22	-1.157	25.0		11	L	9 1.8	1.85
	11.5	334 36 26.2	1 25 32.9	14 55.5	54 41.25	1.005	25.5		11	U	21 23.8	1.82
	12.0	340 36 40.6	0 53 23.3	14 52.5	54 30.07	0.858	26.0		12	L	9 45.5	1.80
	12.5	346 34 55.5	+0 20 50.5	14 49.9	54 20.63	0.717	26.5		12	U	22 7.0	1.78
13.0	352 31 36.0	-0 11 45.7	14 47.8	54 12.83	0.584	27.0		13	L	10 28.3	1.77	
13.5	358 27 5.5	-0 44 5.8	14 46.1	54 6.60	-0.456	27.5		13	U	22 49.5	1.76	
14.0	4 21 45.4	1 15 50.8	14 44.8	54 1.87	0.334	28.0		14	L	11 10.6	1.76	
14.5	10 15 55.3	1 46 42.0	14 43.9	53 58.57	0.216	28.5		14	U	23 31.8	1.77	
15.0	16 9 53.2	2 16 21.1	14 43.4	53 56.66	-0.103	29.0		15	L	11 53.1	1.78	
15.5	22 3 55.6	2 44 30.5	14 43.2	53 56.08	+0.007	29.5				.....	...
16.0	27 58 17.4	-3 10 53.2	14 43.4	53 56.83	+0.117	0.2		16	U	0 14.5	1.80	
16.5	33 53 13.1	3 35 13.2	14 44.0	53 58.88	0.227	0.7		16	L	12 36.2	1.82	
17.0	39 48 56.6	3 57 15.3	14 44.9	54 2.28	0.339	1.2		17	U	0 58.1	1.84	
17.5	45 45 41.2	4 16 45.4	14 46.2	54 7.02	0.453	1.7		17	L	13 20.3	1.87	
18.0	51 43 40.8	4 33 30.3	14 47.9	54 13.16	0.572	2.2		18	U	1 42.9	1.90	
18.5	57 43 9.4	-4 47 18.3	14 50.0	54 20.76	+0.696	2.7		18	L	14 5.9	1.93	
19.0	63 44 22.2	4 57 58.9	14 52.4	54 29.88	0.825	3.2		19	U	2 29.3	1.97	
19.5	69 47 35.1	5 5 22.9	14 55.4	54 40.58	0.960	3.7		19	L	14 53.1	2.00	
20.0	75 53 5.7	5 9 22.4	14 58.7	54 52.93	1.099	4.2		20	U	3 17.2	2.02	
20.5	82 1 12.5	5 9 51.1	15 2.6	55 6.98	1.244	4.7		20	L	15 41.7	2.06	
21.0	88 12 16.3	-5 6 44.0	15 6.9	55 22.79	+1.391	5.2		21	U	4 6.6	2.09	
21.5	94 26 38.5	4 59 57.8	15 11.6	55 40.36	1.537	5.7		21	L	16 31.8	2.11	
22.0	100 44 42.3	4 49 30.9	15 16.9	55 59.68	1.682	6.2		22	U	4 57.2	2.13	
22.5	107 6 51.8	4 35 23.5	15 22.6	56 20.71	1.822	6.7		22	L	17 22.9	2.15	
23.0	113 33 31.2	4 17 38.2	15 28.8	56 43.36	1.950	7.2		23	U	5 48.7	2.16	
23.5	120 5 4.9	-3 56 19.6	15 35.4	57 7.45	+2.063	7.7		23	L	18 14.7	2.17	
24.0	126 41 56.3	-3 31 35.5	15 42.3	57 32.79	+2.155	8.2		24	U	6 40.8	2.18	

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	° ' "	° ' "	' "	' "	"	d			h m	m	
Apr. 24.0	126 41 56.3	-3 31 35.5	15 42.3	57 32.79	+2.155	8.2	Apr. 24	U	6 40.8	2.18	
24.5	133 24 26.5	3 3 36.9	15 49.4	57 59.06	2 219	8.7	24	L	19 7.0	2.19	
25.0	140 12 53.8	2 32 38.5	15 56.8	58 25.90	2.218	9.2	25	U	7 33.3	2.20	
25.5	147 7 31.8	1 58 59.5	16 4.1	58 52.85	2.236	9.7	25	L	19 59.7	2.21	
26.0	154 8 28.1	1 23 3.4	16 11.3	59 19.38	2.177	10.2	26	U	8 26.3	2.22	
26.5	161 15 42.8	-0 45 19.3	16 18.3	59 44.88	+2.065	10.7	26	L	20 53.0	2.23	
27.0	168 29 7.1	-0 6 20.9	16 24.8	60 8.71	1.897	11.2	27	U	9 19.9	2.25	
27.5	175 48 21.9	+0 33 13.3	16 30.6	60 30.18	1.672	11.7	27	L	21 47.1	2.28	
28.0	183 12 56.8	1 12 40.2	16 35.6	60 48.61	1.392	12.2	28	U	10 14.6	2.31	
28.5	190 42 10.0	1 51 14.1	16 39.7	61 3.38	1.062	12.7	28	L	22 42.5	2.34	
29.0	198 15 7.9	+2 28 7.9	16 42.5	61 13.93	+0.691	13.2	29	U	11 10.8	2.37	
29.5	205 50 47.0	3 2 34.6	16 44.2	61 19.84	+0.290	13.7	29	L	23 39.4	2.40	
30.0	213 27 55.0	3 33 50.4	16 44.4	61 20.83	-0.126	14.2	30	U	12 8.5	2.43	
30.5	221 5 13.9	4 1 16.0	16 43.3	61 16.82	0.511	14.7			.....	...
May 1.0	228 41 23.2	4 24 18.7	16 40.9	61 7.91	0.910	15.2	May 1	L	0 37.8	2.45	
1.5	236 15 3.7	+4 42 34.5	16 37.2	60 54.37	-1.309	15.7	1	U	13 7.4	2.47	
2.0	243 45 0.6	4 55 47.7	16 32.4	60 36.66	1.635	16.2	2	L	1 37.2	2.48	
2.5	251 10 7.0	5 3 51.9	16 26.6	60 15.34	1.909	16.7	2	U	14 6.9	2.47	
3.0	258 29 26.3	5 6 49.5	16 20.0	59 51.07	2.125	17.2	3	L	2 36.5	2.45	
3.5	265 42 14.4	5 4 49.7	16 12.7	59 24.57	2.282	17.7	3	U	15 5.8	2.42	
4.0	272 47 59.6	+4 58 8.6	16 5.1	58 56.53	-2.380	18.2	4	L	3 34.6	2.38	
4.5	279 46 23.5	4 47 6.3	15 57.2	58 27.67	2.421	18.7	4	U	16 2.8	2.32	
5.0	286 37 19.7	4 32 6.6	15 49.3	57 58.63	2.411	19.2	5	L	4 30.3	2.26	
5.5	293 20 53.2	4 13 34.9	15 41.5	57 29.98	2.357	19.7	5	U	16 57.0	2.20	
6.0	299 57 18.3	3 51 57.3	15 34.0	57 2.22	2.264	20.2	6	L	5 23.0	2.13	
6.5	306 26 57.1	+3 27 40.2	15 26.7	56 35.77	-2.140	20.7	6	U	17 48.2	2.07	
7.0	312 50 18.0	3 1 9.0	15 20.0	56 10.96	1.991	21.2	7	L	6 12.6	2.00	
7.5	319 7 53.9	2 32 48.3	15 13.7	55 48.05	1.825	21.7	7	U	18 36.3	1.95	
8.0	325 20 20.9	2 3 1.4	15 8.1	55 27.22	1.645	22.2	8	L	6 59.4	1.90	
8.5	331 28 16.7	1 32 10.5	15 3.0	55 8.60	1.457	22.7	8	U	19 22.0	1.86	
9.0	337 32 20.4	+1 0 36.7	14 58.5	54 52.26	-1.267	23.2	9	L	7 44.1	1.82	
9.5	343 33 10.2	+0 28 40.1	14 54.7	54 38.20	1.076	23.7	9	U	20 5.7	1.79	
10.0	349 31 23.9	-0 3 20.5	14 51.5	54 26.43	0.887	24.2	10	L	8 27.1	1.78	
10.5	355 27 37.6	0 35 6.3	14 48.9	54 16.89	0.705	24.7	10	U	20 48.4	1.77	
11.0	1 22 25.6	1 6 19.8	14 46.9	54 9.49	0.529	25.2	11	L	9 9.5	1.75	
11.5	7 16 19.8	-1 36 43.4	14 45.4	54 4.16	-0.362	25.7	11	U	21 30.5	1.76	
12.0	13 9 49.6	2 6 0.2	14 44.5	54 0.77	0.205	26.2	12	L	9 51.7	1.77	
12.5	19 3 21.6	2 33 53.6	14 44.1	53 59.21	-0.056	26.7	12	U	22 12.9	1.78	
13.0	24 57 19.6	3 0 7.3	14 44.1	53 59.38	+0.083	27.2	13	L	10 34.4	1.80	
13.5	30 52 4.6	3 24 25.5	14 44.6	54 1.15	0.210	27.7	13	U	22 56.2	1.83	
14.0	36 47 54.8	-3 46 33.0	14 45.5	54 4.39	+0.329	28.2	14	L	11 18.3	1.85	
14.5	42 45 5.9	4 6 15.1	14 46.8	54 9.01	0.441	28.7	14	U	23 40.7	1.88	
15.0	48 43 51.2	4 23 18.3	14 48.4	54 14.94	0.545	29.2	15	L	12 3.5	1.92	
15.5	54 44 22.0	4 37 29.7	14 50.3	54 22.07	0.642	0.1			.....	...
16.0	60 46 47.5	4 48 38.1	14 52.6	54 30.34	0.735	0.6	16	U	0 26.8	1.96	
16.5	66 51 16.2	-4 56 33.4	14 55.1	54 39.71	+0.825	1.1	16	L	12 50.5	1.99	
17.0	72 57 55.3	-5 1 7.2	14 58.0	54 50.14	+0.914	1.6	17	U	1 14.6	2.02	

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
May	17.0	72 57 55.3	-5 1 7.2	14 58.0	54 50.14	+0.914	1.6	May 17	U	1 14.6	2.02
	17.5	79 6 52.0	5 2 13.1	15 1.1	55 1.63	1.001	2.1	17	L	13 39.0	2.05
	18.0	85 18 13.4	4 59 46.5	15 4.5	55 14.15	1.086	2.6	18	U	2 3.8	2.08
	18.5	91 32 7.2	4 53 44.9	15 8.2	55 27.71	1.174	3.1	18	L	14 28.9	2.11
	19.0	97 48 42.2	4 44 8.0	15 12.2	55 42.33	1.262	3.6	19	U	2 54.3	2.12
	19.5	104 8 8.6	-4 30 57.9	15 16.4	55 58.00	+1.350	4.1	19	L	15 19.7	2.13
	20.0	110 30 37.9	4 14 18.8	15 21.0	56 14.74	1.438	4.6	20	U	3 45.3	2.14
	20.5	116 56 23.3	3 54 17.6	15 25.9	56 32.51	1.523	5.1	20	L	16 11.0	2.14
	21.0	123 25 39.5	3 31 3.8	15 31.0	56 51.28	1.604	5.6	21	U	4 36.6	2.14
	21.5	129 58 42.4	3 4 49.4	15 36.3	57 10.98	1.678	6.1	21	L	17 2.3	2.14
	22.0	136 35 48.8	-2 35 49.4	15 41.9	57 31.50	+1.740	6.6	22	U	5 27.9	2.13
	22.5	143 17 15.7	2 4 21.7	15 47.7	57 52.67	1.786	7.1	22	L	17 53.5	2.13
	23.0	150 3 19.0	1 30 47.3	15 53.6	58 14.28	1.812	7.6	23	U	6 19.1	2.14
	23.5	156 54 13.2	0 55 30.5	15 59.5	58 36.06	1.813	8.1	23	L	18 44.8	2.15
	24.0	163 50 9.4	-0 18 59.2	16 5.4	58 57.67	1.783	8.6	24	U	7 10.6	2.16
	24.5	170 51 14.5	+0 18 15.6	16 11.1	59 18.71	+1.717	9.1	24	L	19 36.6	2.17
	25.0	177 57 29.2	0 55 39.5	16 16.6	59 38.72	1.611	9.6	25	U	8 2.8	2.19
	25.5	185 8 46.9	1 32 35.3	16 21.6	59 57.21	1.462	10.1	25	L	20 29.3	2.23
	26.0	192 24 52.2	2 8 23.6	16 26.1	60 13.64	1.270	10.6	26	U	8 56.3	2.27
	26.5	199 45 19.8	2 42 23.9	16 29.9	60 27.51	1.034	11.1	26	L	21 23.7	2.30
	27.0	207 9 34.0	+3 13 55.6	16 32.8	60 38.29	+0.758	11.6	27	U	9 51.5	2.34
	27.5	214 36 48.8	3 42 19.8	16 34.8	60 45.56	0.448	12.1	27	L	22 19.9	2.39
	28.0	222 6 8.6	4 7 0.6	16 35.7	60 48.94	+0.112	12.6	28	U	10 48.8	2.43
	28.5	229 36 29.8	4 27 27.2	16 35.5	60 48.20	-0.238	13.1	28	L	23 18.2	2.46
	29.0	237 6 43.1	4 43 15.2	16 34.2	60 43.23	0.590	13.6	29	U	11 47.8	2.48
	29.5	244 35 36.2	+4 54 7.8	16 31.7	60 34.08	-0.933	14.1			.....	...
	30.0	252 1 57.6	4 59 56.2	16 28.1	60 20.92	1.254	14.6	30	L	0 17.7	2.49
	30.5	259 24 39.1	5 0 40.2	16 23.5	60 4.11	1.542	15.1	30	U	12 47.6	2.49
	31.0	266 42 39.5	4 56 27.7	16 18.0	59 44.07	1.789	15.6	31	L	1 17.4	2.47
	31.5	273 55 6.4	4 47 33.0	16 11.9	59 21.36	1.988	16.1	31	U	13 46.8	2.44
June	1.0	281 1 18.7	+4 34 16.7	16 5.1	58 56.56	-2.135	16.6	June 1	L	2 15.8	2.39
	1.5	288 0 46.9	4 17 3.4	15 58.0	58 30.32	2.230	17.1	1	U	14 44.1	2.33
	2.0	294 53 13.7	3 56 20.6	15 50.6	58 3.24	2.274	17.6	2	L	3 11.6	2.26
	2.5	301 38 33.2	3 32 37.3	15 43.1	57 35.94	2.269	18.1	2	U	15 38.3	2.19
	3.0	308 16 50.4	3 6 22.7	15 35.8	57 8.96	2.221	18.6	3	L	4 4.2	2.12
	3.5	314 48 19.5	+2 38 5.5	15 28.7	56 42.80	-2.133	19.1	3	U	16 29.2	2.05
	4.0	321 13 22.6	2 8 13.3	15 21.9	56 17.90	2.013	19.6	4	L	4 53.5	2.00
	4.5	327 32 28.2	1 37 12.0	15 15.5	55 54.60	1.865	20.1	4	U	17 17.1	1.94
	5.0	333 46 9.7	1 5 25.8	15 9.7	55 33.23	1.695	20.6	5	L	5 40.0	1.88
	5.5	339 55 4.1	0 33 17.2	15 4.5	55 13.98	1.510	21.1	5	U	18 2.3	1.84
	6.0	345 59 50.7	+0 1 6.8	14 59.8	54 57.04	-1.312	21.6	6	L	6 24.2	1.81
	6.5	352 1 10.1	-0 30 46.1	14 55.9	54 42.52	1.107	22.1	6	U	18 45.8	1.79
	7.0	357 59 43.2	1 2 3.4	14 52.6	54 30.48	0.900	22.6	7	L	7 7.1	1.77
	7.5	3 56 10.9	1 32 28.3	14 50.0	54 20.93	0.692	23.1	7	U	19 28.3	1.76
	8.0	9 51 12.3	2 1 44.7	14 48.1	54 13.86	0.487	23.6	8	L	7 49.4	1.76
	8.5	15 45 25.5	-2 29 37.0	14 46.8	54 9.21	-0.289	24.1	8	U	20 10.6	1.77
	9.0	21 39 26.1	-2 55 50.4	14 46.2	54 6.90	-0.098	24.6	9	L	8 31.9	1.78

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
June	9.0	21 39 26.1	-2 55 50.4	14 46.2	54 6.90	-0.098	24.6	June 9	L	8 31.9	1.78
	9.5	27 33 47.5	3 20 10.3	14 46.2	54 6.81	+0.082	25.1	9	U	20 53.4	1.80
	10.0	33 28 59.9	3 42 22.5	14 46.7	54 8.82	0.251	25.6	10	L	9 15.2	1.83
	10.5	39 25 30.6	4 2 13.2	14 47.8	54 12.79	0.408	26.1	10	U	21 37.4	1.86
	11.0	45 23 43.4	4 19 29.0	14 49.4	54 18.56	0.551	26.6	11	L	9 59.9	1.89
	11.5	51 23 58.8	-4 33 57.1	14 51.4	54 25.95	+0.679	27.1	11	U	22 22.9	1.94
	12.0	57 26 33.7	4 45 25.6	14 53.8	54 34.79	0.793	27.6	12	L	10 46.4	1.98
	12.5	63 31 41.3	4 53 43.7	14 56.5	54 44.92	0.892	28.1	12	U	23 10.4	2.02
	13.0	69 39 31.9	4 58 41.9	14 59.6	54 56.14	0.977	28.6	13	L	11 34.8	2.05
	13.5	75 50 12.2	5 0 12.2	15 2.9	55 8.31	1.049	29.1	13	U	23 59.6	2.09
	14.0	82 3 46.5	-4 58 9.0	15 6.4	55 21.26	+1.108	0.0	14	L	12 24.9	2.12
	14.5	88 20 16.7	4 52 28.4	15 10.1	55 34.85	1.155	0.5			.....	...
	15.0	94 39 42.8	4 43 9.5	15 14.0	55 48.95	1.193	1.0	15	U	0 50.4	2.13
	15.5	101 2 3.6	4 30 14.2	15 17.9	56 3.46	1.224	1.5	15	L	13 16.1	2.15
	16.0	107 27 17.4	4 13 47.0	15 22.0	56 18.29	1.246	2.0	16	U	1 42.0	2.16
	16.5	113 55 22.8	-3 53 55.7	15 26.1	56 33.35	+1.263	2.5	16	L	14 8.0	2.16
	17.0	120 26 18.3	3 30 51.3	15 30.2	56 48.59	1.276	3.0	17	U	2 33.9	2.16
	17.5	127 0 4.2	3 4 47.6	15 34.4	57 3.96	1.284	3.5	17	L	14 59.8	2.15
	18.0	133 36 41.5	2 36 1.8	15 38.6	57 19.40	1.289	4.0	18	U	3 25.5	2.14
	18.5	140 16 13.0	2 4 53.9	15 42.9	57 34.88	1.290	4.5	18	L	15 51.2	2.13
	19.0	146 58 43.0	-1 31 46.3	15 47.1	57 50.35	+1.287	5.0	19	U	4 16.7	2.12
	19.5	153 44 17.0	0 57 4.6	15 51.2	58 5.73	1.275	5.5	19	L	16 42.1	2.12
	20.0	160 33 1.0	-0 21 16.2	15 55.4	58 20.93	1.257	6.0	20	U	5 7.4	2.11
	20.5	167 25 1.4	+0 15 9.0	15 59.5	58 35.86	1.228	6.5	20	L	17 32.8	2.12
	21.0	174 20 23.5	0 51 39.1	16 3.4	58 50.33	1.182	7.0	21	U	5 58.2	2.12
	21.5	181 19 11.0	+1 27 41.2	16 7.2	59 4.16	+1.121	7.5	21	L	18 23.7	2.14
	22.0	188 21 24.3	2 2 40.7	16 10.7	59 17.15	1.039	8.0	22	U	6 49.6	2.17
	22.5	195 26 59.9	2 36 2.7	16 13.9	59 29.01	0.934	8.5	22	L	19 15.7	2.19
	23.0	202 35 48.8	3 7 12.5	16 16.8	59 39.47	0.804	9.0	23	U	7 42.2	2.23
	23.5	209 47 35.7	3 35 36.1	16 19.2	59 48.20	0.648	9.5	23	L	20 9.2	2.27
	24.0	217 1 58.3	+4 0 41.5	16 21.0	59 54.91	+0.466	10.0	24	U	8 36.7	2.31
	24.5	224 18 26.8	4 21 59.6	16 22.2	59 59.28	0.259	10.5	24	L	21 4.7	2.35
	25.0	231 36 24.0	4 39 5.1	16 22.7	60 1.05	+0.032	11.0	25	U	9 33.2	2.39
	25.5	238 55 6.5	4 51 38.3	16 22.4	59 59.98	-0.212	11.5	25	L	22 2.1	2.42
	26.0	246 13 45.1	4 59 24.8	16 21.3	59 55.94	0.464	12.0	26	U	10 31.3	2.44
	26.5	253 31 26.9	+5 2 17.4	16 19.4	59 48.84	-0.719	12.5	26	L	23 0.7	2.46
	27.0	260 47 17.9	5 0 15.7	16 16.6	59 38.70	0.968	13.0	27	U	11 30.2	2.45
	27.5	268 0 24.1	4 53 26.2	16 13.0	59 25.67	1.202	13.5	27	L	23 59.5	2.43
	28.0	275 9 55.0	4 42 2.1	16 8.8	59 9.94	1.415	14.0	28	U	12 28.4	2.39
	28.5	282 15 4.8	4 26 22.2	16 3.8	58 51.83	1.599	14.5			.....	...
	29.0	289 15 15.0	+4 6 50.0	15 58.3	58 31.70	-1.749	15.0	29	L	0 56.9	2.35
	29.5	296 9 55.0	3 43 52.7	15 52.4	58 10.00	1.862	15.5	29	U	13 24.7	2.29
	30.0	302 58 43.2	3 17 59.6	15 46.2	57 47.18	1.934	16.0	30	L	1 51.8	2.23
	30.5	309 41 27.3	2 49 41.1	15 39.8	57 23.75	1.965	16.5	30	U	14 18.1	2.16
July	1.0	316 18 4.1	2 19 27.8	15 33.4	57 0.17	1.958	17.0	July 1	L	2 43.7	2.10
	1.5	322 48 38.8	+1 47 49.2	15 27.1	56 36.91	-1.912	17.5	1	U	15 8.4	2.03
	2.0	329 13 24.6	+1 15 13.8	15 20.9	56 14.41	-1.833	18.0	2	L	3 32.4	1.97

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
July	1.0	316 18 4.1	+2 19 27.8	15 33.4	57 0.17	-1.958	17.0	July 1	L	2 43.7	2.10
	1.5	322 48 38.8	1 47 49.2	15 27.1	56 36.91	1.912	17.5	1	U	15 8.4	2.03
	2.0	329 13 24.6	1 15 13.8	15 20.9	56 14.41	1.833	18.0	2	L	3 32.4	1.97
	2.5	335 32 41.0	0 42 7.7	15 15.1	55 53.05	1.722	18.5	2	U	15 55.7	1.92
	3.0	341 46 53.6	+0 8 55.5	15 9.7	55 33.18	1.585	19.0	3	L	4 18.5	1.87
	3.5	347 56 32.5	-0 24 0.5	15 4.8	55 15.11	-1.424	19.5	3	U	16 40.7	1.84
	4.0	354 2 11.4	0 56 19.9	15 0.4	54 59.08	1.245	20.0	4	L	5 2.6	1.81
	4.5	0 4 27.0	1 27 44.1	14 56.6	54 45.28	1.051	20.5	4	U	17 24.1	1.79
	5.0	6 3 57.4	1 57 56.3	14 53.5	54 33.87	0.848	21.0	5	L	5 45.5	1.73
	5.5	12 1 22.1	2 26 40.7	14 51.1	54 24.96	0.637	21.5	5	U	18 6.8	1.77
	6.0	17 57 20.6	-2 53 42.7	14 49.4	54 18.60	-0.422	22.0	6	L	6 28.0	1.77
	6.5	23 52 32.5	3 18 48.6	14 48.3	54 14.82	-0.208	22.5	6	U	18 49.4	1.79
	7.0	29 47 36.4	3 41 45.4	14 48.0	54 13.60	+0.004	23.0	7	L	7 10.9	1.81
	7.5	35 43 9.4	4 2 20.3	14 48.4	54 14.89	0.210	23.5	7	U	19 32.8	1.83
	8.0	41 39 46.7	4 20 21.3	14 49.4	54 18.60	0.107	24.0	8	L	7 54.9	1.86
	8.5	47 38 1.2	-4 35 36.6	14 51.0	54 24.62	+0.594	24.5	8	U	20 17.5	1.90
	9.0	53 38 23.0	4 47 54.8	14 53.2	54 32.80	0.767	25.0	9	L	8 40.5	1.94
	9.5	59 41 18.9	4 57 5.1	14 56.0	54 42.96	0.923	25.5	9	U	21 4.0	1.98
	10.0	65 47 12.3	5 2 57.6	14 59.3	54 54.89	1.062	26.0	10	L	9 28.1	2.02
	10.5	71 56 22.2	5 5 23.4	15 2.9	55 8.37	1.181	26.5	10	U	21 52.6	2.07
	11.0	78 9 4.0	-5 4 14.9	15 7.0	55 23.15	+1.279	27.0	11	L	10 17.7	2.11
	11.5	84 25 28.5	4 59 26.6	15 11.3	55 38.98	1.355	27.5	11	U	22 43.1	2.14
	12.0	90 45 42.3	4 50 54.9	15 15.8	55 55.58	1.407	28.0	12	L	11 9.0	2.17
	12.5	97 9 47.8	4 38 39.3	15 20.5	56 12.66	1.436	28.5	12	U	23 35.1	2.18
	13.0	103 37 43.4	4 22 42.0	15 25.2	56 29.96	1.443	29.0	13	L	12 1.4	2.20
	13.5	110 9 24.1	-4 3 9.1	15 29.9	56 47.21	+1.429	0.0			.....	...
	14.0	116 44 41.9	3 40 9.9	15 34.5	57 4.17	1.395	0.5	14	U	0 27.9	2.21
	14.5	123 23 26.1	3 13 58.0	15 39.0	57 20.62	1.343	1.0	14	L	12 54.3	2.20
	15.0	130 5 24.5	2 44 51.2	15 43.2	57 36.35	1.277	1.5	15	U	1 20.7	2.20
	15.5	136 50 24.0	2 13 10.4	15 47.3	57 51.22	1.199	2.0	15	L	13 47.0	2.18
	16.0	143 38 10.9	-1 39 20.5	15 51.1	58 5.08	+1.110	2.5	16	U	2 13.1	2.17
	16.5	150 28 32.2	1 3 49.6	15 54.6	58 17.85	1.017	3.0	16	L	14 39.0	2.15
	17.0	157 21 15.2	-0 27 8.5	15 57.7	58 29.48	0.921	3.5	17	U	3 4.8	2.14
	17.5	164 16 8.5	+0 10 10.4	16 0.6	58 39.94	0.822	4.0	17	L	15 30.4	2.13
	18.0	171 13 1.8	0 47 32.9	16 3.1	58 49.20	0.723	4.5	18	U	3 56.0	2.13
	18.5	178 11 45.7	+1 24 24.0	16 5.3	58 57.29	+0.625	5.0	18	L	16 21.5	2.13
	19.0	185 12 11.7	2 0 8.8	16 7.2	59 4.20	0.527	5.5	19	U	4 47.1	2.14
	19.5	192 14 11.7	2 34 12.8	16 8.8	59 9.94	0.430	6.0	19	L	17 12.8	2.15
	20.0	199 17 37.0	3 6 2.9	16 10.0	59 14.52	0.333	6.5	20	U	5 38.8	2.17
	20.5	206 22 18.2	3 35 7.7	16 10.9	59 17.91	0.233	7.0	20	L	18 5.0	2.19
	21.0	213 28 4.2	+4 0 58.3	16 11.5	59 20.08	+0.128	7.5	21	U	6 31.5	2.23
	21.5	220 34 41.7	4 23 9.0	16 11.8	59 20.96	+0.018	8.0	21	L	18 58.5	2.26
	22.0	227 41 54.4	4 41 17.3	16 11.6	59 20.50	-0.097	8.5	22	U	7 25.8	2.30
	22.5	234 49 23.2	4 55 5.4	16 11.1	59 18.61	0.220	9.0	22	L	19 53.6	2.33
	23.0	241 56 45.4	5 4 19.8	16 10.2	59 15.18	0.351	9.5	23	U	8 21.7	2.35
	23.5	249 3 35.5	+5 8 52.0	16 8.8	59 10.15	-0.489	10.0	23	L	20 50.1	2.38
	24.0	256 9 25.1	+5 8 39.0	16 7.0	59 3.43	-0.632	10.5	24	U	9 18.7	2.39

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ' "	° ' "	' "	' "	"	d	July 24	U	h m	m
July 24.0	256 9 25.1	+5 8 39.0	16 7.0	59 3.43	-0.632	10.5	July 24	U	9 18.7	2.39
24.5	263 13 43.8	5 3 43.6	16 4.7	58 54.98	0.777	11.0	24	L	21 47.4	2.38
25.0	270 16 0.1	4 54 13.5	16 1.9	58 44.79	0.921	11.5	25	U	10 15.9	2.37
25.5	277 15 42.4	4 40 21.9	15 58.6	58 32.88	1.063	12.0	25	L	22 44.3	2.35
26.0	284 12 20.2	4 22 26.9	15 55.0	58 19.32	1.195	12.5	26	U	11 12.2	2.31
26.5	291 5 25.3	+4 0 50.4	15 50.8	58 4.25	-1.314	13.0	26	L	23 39.7	2.27
27.0	297 54 32.7	3 35 57.8	15 46.4	57 47.84	1.417	13.5	27	U	12 6.6	2.21
27.5	304 39 21.6	3 8 16.9	15 41.6	57 30.33	1.499	14.0			.....	...
28.0	311 19 36.2	2 38 17.2	15 36.6	57 11.96	1.558	14.5	28	L	0 32.8	2.15
28.5	317 55 6.2	2 6 28.7	15 31.5	56 53.04	1.591	15.0	28	U	12 58.3	2.10
29.0	324 25 46.8	+1 33 21.4	15 26.2	56 33.88	-1.597	15.5	29	L	1 23.1	2.04
29.5	330 51 39.0	0 59 24.3	15 21.0	56 14.83	1.575	16.0	29	U	13 47.2	1.99
30.0	337 12 49.3	+0 25 4.9	15 16.0	55 56.20	1.525	16.5	30	L	2 10.8	1.94
30.5	343 29 29.8	-0 9 10.5	15 11.1	55 38.35	1.447	17.0	30	U	14 33.7	1.89
31.0	349 41 57.1	0 42 58.3	15 6.5	55 21.57	1.315	17.5	31	L	2 56.2	1.86
31.5	355 50 32.5	-1 15 56.5	15 2.3	55 6.16	-1.219	18.0	31	U	15 18.3	1.83
Aug. 1.0	1 55 40.9	1 47 45.4	14 58.6	54 52.39	1.072	18.5	Aug. 1	L	3 40.1	1.80
1.5	7 57 50.7	2 18 7.0	14 55.3	54 40.51	0.906	19.0	1	U	16 1.6	1.79
2.0	13 57 32.8	2 46 45.4	14 52.7	54 30.71	0.725	19.5	2	L	4 23.1	1.79
2.5	19 55 20.7	3 13 26.0	14 50.6	54 23.17	0.530	20.0	2	U	16 44.5	1.78
3.0	25 51 49.2	-3 37 55.4	14 49.2	54 18.02	-0.326	20.5	3	L	5 5.9	1.79
3.5	31 47 34.5	4 0 1.5	14 48.5	54 15.38	-0.114	21.0	3	U	17 27.5	1.81
4.0	37 43 13.1	4 19 33.0	14 48.5	54 15.30	+0.102	21.5	4	L	5 49.3	1.83
4.5	43 39 22.2	4 36 19.1	14 49.2	54 17.82	0.318	22.0	4	U	18 11.4	1.86
5.0	49 36 38.3	4 50 9.8	14 50.5	54 22.92	0.532	22.5	5	L	6 33.9	1.89
5.5	55 35 37.1	-5 0 55.4	14 52.6	54 30.57	+0.741	23.0	5	U	18 56.8	1.93
6.0	61 36 52.8	5 8 26.9	14 55.4	54 40.66	0.940	23.5	6	L	7 20.2	1.97
6.5	67 40 57.9	5 12 35.7	14 58.8	54 53.09	1.128	24.0	6	U	19 44.1	2.01
7.0	73 48 22.4	5 13 14.1	15 2.7	55 7.67	1.299	24.5	7	L	8 8.5	2.05
7.5	79 59 33.0	5 10 15.3	15 7.2	55 24.19	1.451	25.0	7	U	20 33.4	2.10
8.0	86 14 53.0	-5 3 34.2	15 12.2	55 42.41	+1.581	25.5	8	L	8 58.8	2.13
8.5	92 34 41.6	4 53 7.2	15 17.5	56 2.03	1.684	26.0	8	U	21 24.6	2.16
9.0	98 59 13.3	4 38 53.3	15 23.2	56 22.70	1.757	26.5	9	L	9 50.7	2.19
9.5	105 28 37.1	4 20 54.2	15 29.0	56 44.06	1.797	27.0	9	U	22 17.2	2.21
10.0	112 2 57.2	3 59 15.4	15 34.9	57 5.71	1.804	27.5	10	L	10 43.8	2.23
10.5	118 42 12.2	-3 34 5.9	15 40.8	57 27.22	+1.776	28.0	10	U	23 10.6	2.23
11.0	125 26 14.3	3 5 39.6	15 46.5	57 48.20	1.714	28.5	11	L	11 37.4	2.23
11.5	132 14 51.6	2 34 14.7	15 51.9	58 8.22	1.618	29.0			.....	...
12.0	139 7 46.2	2 0 14.4	15 57.0	58 26.90	1.490	0.0	12	U	0 4.2	2.22
12.5	146 4 36.2	1 24 6.3	16 1.6	58 43.87	1.335	0.5	12	L	12 30.8	2.22
13.0	153 4 55.8	-0 46 22.5	16 5.7	58 58.85	+1.158	1.0	13	U	0 57.4	2.21
13.5	160 8 16.5	-0 7 38.4	16 9.2	59 11.60	0.965	1.5	13	L	13 23.9	2.20
14.0	167 14 7.6	+0 31 28.0	16 12.0	59 21.96	0.761	2.0	14	U	1 50.2	2.19
14.5	174 21 57.8	1 10 16.9	16 14.2	59 29.85	0.554	2.5	14	L	14 16.5	2.19
15.0	181 31 15.3	1 48 8.2	16 15.6	59 35.27	0.350	3.0	15	U	2 42.7	2.18
15.5	188 41 29.3	+2 24 22.8	16 16.5	59 38.27	+0.153	3.5	15	L	15 8.9	2.19
16.0	195 52 9.8	+2 58 23.3	16 16.7	59 38.98	-0.032	4.0	16	U	3 35.2	2.20

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ' "	° ' "	' "	' "	"	d		h m	m	
Aug. 16.0	195 52 9.8	+2 58 23.3	16 16.7	59 38.98	-0.032	4.0	Aug. 16	U	3 35.2	2.20
16.5	203 2 49.3	3 29 35.0	16 16.3	59 37.56	0.202	4.5	16	L	16 1.7	2.21
17.0	210 13 2.2	3 57 27.3	16 15.4	59 34.21	0.354	5.0	17	U	4 28.3	2.23
17.5	217 22 25.1	4 21 33.8	16 14.0	59 29.14	0.487	5.5	17	L	16 55.2	2.25
18.0	224 30 36.9	4 41 32.8	16 12.2	59 22.58	0.604	6.0	18	U	5 22.3	2.27
18.5	231 37 18.9	+4 57 7.7	16 10.1	59 14.71	-0.705	6.5	18	L	17 49.6	2.29
19.0	238 42 14.2	5 8 7.0	16 7.6	59 5.73	0.790	7.0	19	U	6 17.3	2.31
19.5	245 45 7.7	5 14 24.2	16 4.9	58 55.80	0.863	7.5	19	L	18 45.1	2.33
20.0	252 45 45.7	5 15 58.0	16 2.0	58 45.06	0.927	8.0	20	U	7 13.1	2.33
20.5	259 43 55.9	5 12 51.5	15 58.8	58 33.58	0.984	8.5	20	L	19 41.1	2.33
21.0	266 39 26.8	+5 5 12.4	15 55.5	58 21.47	-1.034	9.0	21	U	8 9.1	2.33
21.5	273 32 7.8	4 53 12.5	15 52.1	58 8.77	1.081	9.5	21	L	20 37.0	2.31
22.0	280 21 49.0	4 37 7.5	15 48.5	57 55.54	1.124	10.0	22	U	9 4.6	2.28
22.5	287 8 21.4	4 17 16.2	15 44.7	57 41.81	1.164	10.5	22	L	21 31.8	2.25
23.0	293 51 36.9	3 54 0.4	15 40.9	57 27.62	1.201	11.0	23	U	9 58.5	2.20
23.5	300 31 28.2	+3 27 44.1	15 36.9	57 13.01	-1.233	11.5	23	L	22 24.7	2.16
24.0	307 7 49.4	2 58 53.4	15 32.8	56 58.06	1.259	12.0	24	U	10 50.4	2.11
24.5	313 40 35.8	2 27 55.7	15 28.7	56 42.83	1.278	12.5	24	L	23 15.4	2.06
25.0	320 9 41.7	1 55 18.8	15 24.5	56 27.43	1.287	13.0	25	U	11 39.9	2.01
25.5	326 35 15.1	1 21 30.9	15 20.3	56 11.99	1.285	13.5			.....	...
26.0	332 57 8.0	+0 46 59.9	15 16.1	55 56.63	-1.271	14.0	26	L	0 3.7	1.97
26.5	339 15 27.3	+0 12 12.5	15 12.0	55 41.55	1.241	14.5	26	U	12 27.1	1.93
27.0	345 30 18.7	-0 22 25.3	15 8.0	55 26.92	1.194	15.0	27	L	0 50.0	1.89
27.5	351 41 51.3	0 56 29.4	15 4.2	55 12.95	1.131	15.5	27	U	13 12.4	1.85
28.0	357 50 16.2	1 29 37.2	15 0.6	54 59.84	1.050	16.0	28	L	1 34.5	1.83
28.5	3 55 47.7	-2 1 28.0	14 57.3	54 47.81	-0.952	16.5	28	U	13 56.4	1.81
29.0	9 58 42.8	2 31 43.0	14 54.4	54 37.07	0.835	17.0	29	L	2 18.0	1.79
29.5	15 59 21.0	3 0 5.6	14 51.9	54 27.84	0.701	17.5	29	U	14 39.5	1.79
30.0	21 58 4.6	3 26 20.4	14 49.8	54 20.31	0.551	18.0	30	L	3 1.0	1.80
30.5	27 55 18.1	3 50 14.1	14 48.3	54 14.68	0.385	18.5	30	U	15 22.6	1.80
31.0	33 51 28.3	-4 11 34.7	14 47.3	54 11.13	-0.206	19.0	31	L	3 44.2	1.81
31.5	39 47 3.9	4 30 11.4	14 47.0	54 9.78	-0.016	19.5	31	U	16 6.0	1.83
Sept. 1.0	45 42 35.6	4 45 54.8	14 47.2	54 10.78	+0.184	20.0	Sept. 1	L	4 28.1	1.85
1.5	51 38 35.5	4 58 36.0	14 48.2	54 14.23	0.392	20.5	1	U	16 50.5	1.88
2.0	57 35 36.9	5 8 7.3	14 49.8	54 20.20	0.604	21.0	2	L	5 13.3	1.92
2.5	63 34 13.8	-5 14 21.5	14 52.1	54 28.72	+0.816	21.5	2	U	17 36.5	1.95
3.0	69 35 0.7	5 17 12.1	14 55.1	54 39.79	1.029	22.0	3	L	6 0.1	1.98
3.5	75 38 32.1	5 16 33.3	14 58.8	54 53.39	1.236	22.5	3	U	18 24.1	2.02
4.0	81 45 21.7	5 12 20.3	15 3.2	55 9.41	1.433	23.0	4	L	6 48.6	2.06
4.5	87 56 2.2	5 4 29.3	15 8.2	55 27.73	1.618	23.5	4	U	19 13.6	2.10
5.0	94 11 4.4	-4 52 57.6	15 13.8	55 48.16	+1.784	24.0	5	L	7 39.0	2.13
5.5	100 30 56.3	4 37 44.5	15 19.8	56 10.44	1.926	24.5	5	U	20 4.8	2.16
6.0	106 56 2.4	4 18 51.5	15 26.3	56 34.26	2.039	25.0	6	L	8 30.8	2.18
6.5	113 26 43.5	3 56 22.8	15 33.1	56 59.25	2.120	25.5	6	U	20 57.2	2.21
7.0	120 3 14.5	3 30 26.3	15 40.2	57 24.99	2.162	26.0	7	L	9 23.8	2.22
7.5	126 45 44.7	-3 1 13.6	15 47.2	57 50.97	+2.160	26.5	7	U	21 50.5	2.23
8.0	133 34 16.5	-2 29 1.4	15 54.2	58 16.66	+2.113	27.0	8	L	10 17.3	2.23

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
Sept.	8.0	133 34 16.5	-2 29 1.4	15 54.2	58 16.66	+2.113	27.0	Sept. 8	L	10 17.3	2.23
	8.5	140 28 44.9	1 54 10.9	16 1.0	58 41.50	2.018	27.5	8	U	22 44.1	2.24
	9.0	147 28 56.7	1 17 9.0	16 7.4	59 4.91	1.875	28.0	9	L	11 11.0	2.24
	9.5	154 34 30.8	-0 38 27.7	16 13.2	59 26.32	1.686	28.5	9	U	23 37.9	2.24
	10.0	161 44 58.0	+0 1 16.3	16 18.4	59 45.20	1.455	29.0	10	L	12 4.8	2.25
	10.5	168 59 41.5	+0 41 22.3	16 22.7	60 1.09	+1.188	0.1			.....	...
	11.0	176 17 57.8	1 21 6.5	16 26.1	60 13.60	0.894	0.6	11	U	0 31.8	2.25
	11.5	183 38 58.0	1 59 44.2	16 28.5	60 22.48	0.584	1.1	11	L	12 58.8	2.25
	12.0	191 1 49.5	2 36 30.6	16 29.9	60 27.59	+0.268	1.6	12	U	1 25.9	2.26
	12.5	198 25 37.2	3 10 43.3	16 30.3	60 28.93	-0.043	2.1	12	L	13 53.1	2.27
	13.0	205 49 26.6	+3 41 42.6	16 29.6	60 26.62	-0.339	2.6	13	U	2 20.5	2.29
	13.5	213 12 24.1	4 8 57.7	16 28.1	60 20.89	0.611	3.1	13	L	14 48.1	2.31
	14.0	220 33 40.2	4 31 58.1	16 25.7	60 12.07	0.853	3.6	14	U	3 15.9	2.32
	14.5	227 52 30.3	4 50 24.2	16 22.5	60 0.55	1.060	4.1	14	L	15 43.8	2.34
	15.0	235 8 15.6	5 4 2.2	16 18.8	59 46.77	1.230	4.6	15	U	4 12.0	2.35
	15.5	242 20 24.2	+5 12 45.1	16 14.5	59 31.18	-1.363	5.1	15	L	16 40.2	2.35
	16.0	249 28 31.3	5 16 32.4	16 9.9	59 14.21	1.460	5.6	16	U	5 8.5	2.36
	16.5	256 32 19.0	5 15 29.2	16 5.0	58 56.28	1.524	6.1	16	L	17 36.8	2.36
	17.0	263 31 36.0	5 9 45.3	16 0.0	58 37.75	1.559	6.6	17	U	6 5.0	2.34
	17.5	270 26 16.6	4 59 34.7	15 54.9	58 18.95	1.570	7.1	17	L	18 32.9	2.31
	18.0	277 16 20.8	+4 45 15.1	15 49.7	58 0.14	-1.561	7.6	18	U	7 0.5	2.28
	18.5	284 1 52.3	4 27 6.1	15 44.7	57 41.54	1.537	8.1	18	L	19 27.7	2.25
	19.0	290 42 58.3	4 5 30.1	15 39.7	57 23.31	1.500	8.6	19	U	7 54.5	2.20
	19.5	297 19 48.4	3 40 50.4	15 34.9	57 5.57	1.455	9.1	19	L	20 20.6	2.15
	20.0	303 52 34.0	3 13 31.6	15 30.2	56 48.40	1.406	9.6	20	U	8 46.2	2.11
	20.5	310 21 27.5	+2 43 59.2	15 25.7	56 31.85	-1.352	10.1	20	L	21 11.2	2.06
	21.0	316 46 41.7	2 12 38.7	15 21.4	56 15.96	1.297	10.6	21	U	9 35.7	2.02
	21.5	323 8 29.5	1 39 56.0	15 17.2	56 0.73	1.240	11.1	21	L	21 59.6	1.97
	22.0	329 27 3.6	1 6 16.8	15 13.2	55 46.20	1.182	11.6	22	U	10 23.0	1.93
	22.5	335 42 36.4	+0 32 6.4	15 9.5	55 32.36	1.124	12.1	22	L	22 45.9	1.89
	23.0	341 55 19.7	-0 2 10.6	15 5.9	55 19.24	-1.062	12.6	23	U	11 8.4	1.86
	23.5	348 5 25.1	0 36 10.4	15 2.5	55 6.88	0.998	13.1	23	L	23 30.6	1.84
	24.0	354 13 3.8	1 9 30.1	14 59.4	54 55.31	0.929	13.6	24	U	11 52.5	1.82
	24.5	0 18 27.1	1 41 48.4	14 56.5	54 44.60	0.855	14.1			.....	...
	25.0	6 21 46.4	2 12 45.1	14 53.8	54 34.82	0.773	14.6	25	L	0 14.2	1.80
	25.5	12 23 13.3	-2 42 1.4	14 51.4	54 26.08	-0.683	15.1	25	U	12 35.7	1.79
	26.0	18 23 0.4	3 9 20.5	14 49.3	54 18.47	0.584	15.6	26	L	0 57.2	1.79
	26.5	24 21 21.3	3 34 27.1	14 47.6	54 12.12	0.472	16.1	26	U	13 18.7	1.79
	27.0	30 18 30.9	-3 57 7.4	14 46.3	54 7.18	0.350	16.6	27	L	1 40.3	1.80
	27.5	36 14 45.2	4 17 9.5	14 45.3	54 3.77	0.216	17.1	27	U	14 2.0	1.82
	28.0	42 10 22.4	-4 34 22.6	14 44.9	54 2.04	-0.071	17.6	28	L	2 23.9	1.84
	28.5	48 5 42.5	4 48 37.9	14 44.9	54 2.13	+0.088	18.1	28	U	14 46.1	1.86
	29.0	54 1 7.1	4 59 47.7	14 45.4	54 4.19	0.257	18.6	29	L	3 8.5	1.88
	29.5	59 57 0.2	5 7 45.5	14 46.6	54 8.33	0.435	19.1	29	U	15 31.2	1.91
	30.0	65 53 47.7	5 12 25.9	14 48.3	54 14.68	0.624	19.6	30	L	3 54.3	1.94
	30.5	71 51 57.6	-5 13 44.7	14 50.7	54 23.33	+0.819	20.1	30	U	16 17.7	1.97
Oct.	1.0	77 51 59.5	-5 11 38.6	14 53.7	54 34.36	+1.019	20.6	Oct. 1	L	4 41.5	2.00

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m
Oct.	1.0	77 51 59.5	-5 11 38.6	14 53.7	54 34.36	+1.019	20.6	Oct. 1	L	4 41.5	2.00
	1.5	83 54 24.5	5 6 5.2	14 57.3	54 47.79	1.220	21.1	1	U	17 5.7	2.03
	2.0	89 59 45.3	4 57 3.1	15 1.7	55 3.65	1.422	21.6	2	L	5 30.2	2.05
	2.5	96 8 35.0	4 44 32.3	15 6.6	55 21.90	1.618	22.1	2	U	17 55.0	2.08
	3.0	102 21 27.3	4 28 34.0	15 12.2	55 42.45	1.805	22.6	3	L	6 20.2	2.11
	3.5	108 38 55.3	-4 9 11.1	15 18.4	56 5.15	+1.976	23.1	3	U	18 45.6	2.13
	4.0	115 1 31.0	3 46 28.5	15 25.1	56 29.79	2.128	23.6	4	L	7 11.3	2.15
	4.5	121 29 44.3	3 20 33.6	15 32.3	56 56.11	2.253	24.1	4	U	19 37.2	2.16
	5.0	128 4 2.0	2 51 37.3	15 39.8	57 23.73	2.344	24.6	5	L	8 3.2	2.17
	5.5	134 44 46.0	2 19 53.6	15 47.6	57 52.21	2.396	25.1	5	U	20 29.4	2.19
	6.0	141 32 13.1	-1 45 41.2	15 55.4	58 21.05	+2.402	25.6	6	L	8 55.8	2.20
	6.5	148 26 32.2	1 9 23.1	16 3.2	58 49.65	2.356	26.1	6	U	21 22.3	2.21
	7.0	155 27 43.9	-0 31 27.8	16 10.8	59 17.36	2.253	26.6	7	L	9 48.9	2.22
	7.5	162 35 39.0	+0 7 31.2	16 17.9	59 43.49	2.092	27.1	7	U	22 15.7	2.24
	8.0	169 49 57.2	0 46 55.8	16 24.4	60 7.33	1.872	27.6	8	L	10 42.7	2.26
	8.5	177 10 6.9	+1 26 3.5	16 30.1	60 28.20	+1.597	28.1	8	U	23 10.0	2.28
	9.0	184 35 24.6	2 4 8.9	16 34.8	60 45.47	1.274	28.6	9	L	11 37.5	2.30
	9.5	192 4 56.2	2 40 25.4	16 38.4	60 58.62	0.912	29.1			.....	...
	10.0	199 37 37.8	3 14 6.9	16 40.7	61 7.26	0.524	0.2	10	U	0 5.3	2.33
	10.5	207 12 18.6	3 44 30.3	16 41.8	61 11.15	+0.124	0.7	10	L	12 33.5	2.36
	11.0	214 47 42.5	+4 10 57.2	16 41.5	61 10.24	-0.273	1.2	11	U	1 1.9	2.38
	11.5	222 22 32.4	4 32 55.9	16 40.0	61 4.66	0.653	1.7	11	L	13 30.7	2.41
	12.0	229 55 33.3	4 50 2.6	16 37.3	60 54.68	1.003	2.2	12	U	1 59.8	2.43
	12.5	237 25 35.0	5 2 2.6	16 33.5	60 40.74	1.312	2.7	12	L	14 29.0	2.44
	13.0	244 51 35.3	5 8 49.4	16 28.8	60 23.38	1.572	3.2	13	U	2 58.4	2.45
	13.5	252 12 42.2	+5 10 25.2	16 23.3	60 3.22	-1.779	3.7	13	L	15 27.8	2.45
	14.0	259 28 14.7	5 6 59.5	16 17.2	59 40.89	1.933	4.2	14	U	3 57.1	2.43
	14.5	266 37 43.8	4 58 47.5	16 10.7	59 17.03	2.035	4.7	14	L	16 26.1	2.40
	15.0	273 40 51.7	4 46 9.4	16 3.9	58 52.23	2.090	5.2	15	U	4 54.7	2.36
	15.5	280 37 31.6	4 29 28.7	15 57.1	58 27.05	2.101	5.7	15	L	17 22.8	2.32
	16.0	287 27 46.0	+4 9 11.0	15 50.2	58 1.96	-2.075	6.2	16	U	5 50.4	2.27
	16.5	294 11 45.4	3 45 43.4	15 43.5	57 37.38	2.018	6.7	16	L	18 17.2	2.21
	17.0	300 49 46.5	3 19 33.0	15 37.1	57 13.62	1.938	7.2	17	U	6 43.4	2.15
	17.5	307 22 11.0	2 51 6.9	15 30.9	56 50.94	1.839	7.7	17	L	19 8.8	2.09
	18.0	313 49 24.0	2 20 51.6	15 25.0	56 29.53	1.728	8.2	18	U	7 33.6	2.04
	18.5	320 11 52.3	+1 49 13.2	15 19.6	56 9.51	-1.608	8.7	18	L	19 57.7	1.98
	19.0	326 30 3.8	1 16 36.3	15 14.5	55 50.96	1.483	9.2	19	U	8 21.2	1.94
	19.5	332 44 26.4	0 43 25.0	15 9.9	55 33.92	1.357	9.7	19	L	20 44.2	1.89
	20.0	338 55 27.2	+0 10 2.5	15 5.7	55 18.38	1.233	10.2	20	U	9 6.7	1.86
	20.5	345 3 32.0	-0 23 9.4	15 1.8	55 4.32	1.111	10.7	20	L	21 28.9	1.83
	21.0	351 9 5.0	-0 55 49.4	14 58.4	54 51.71	-0.992	11.2	21	U	9 50.7	1.81
	21.5	357 12 28.4	1 27 37.3	14 55.3	54 40.49	0.878	11.7	21	L	22 12.3	1.80
	22.0	3 14 2.2	1 58 14.0	14 52.6	54 30.62	0.767	12.2	22	U	10 33.8	1.79
	22.5	9 14 4.7	2 27 21.3	14 50.3	54 22.07	0.660	12.7	22	L	22 55.2	1.78
	23.0	15 12 52.0	2 54 42.1	14 48.3	54 14.78	0.555	13.2	23	U	11 16.5	1.78
	23.5	21 10 38.9	-3 20 0.8	14 46.7	54 8.74	-0.452	13.7	23	L	23 38.0	1.80
	24.0	27 7 38.3	-3 43 2.8	14 45.4	54 3.93	-0.349	14.2	24	U	11 59.6	1.80

GREENWICH MEAN TIME.

G. M. T.	Longitude.			Latitude.			Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
	°	'	"	°	'	"					Oct. 24	U	h	m	
Oct. 24.0	27	7	38.3	-3	43	2.8	14 45.4	54 3.93	-0.349	14.2	Oct. 24	U	11	59.6	1.80
24.5	33	4	2.5	4	3	34.8	14 44.4	54 0.37	0.214	14.7			...	...
25.0	39	0	2.9	4	21	25.2	14 43.8	53 58.08	0.136	15.2	25	L	0	21.3	1.82
25.5	44	55	51.0	4	36	24.0	14 43.5	53 57.11	-0.025	15.7	25	U	12	43.3	1.84
26.0	50	51	38.1	4	48	22.3	14 43.6	53 57.50	+0.092	16.2	26	L	1	5.5	1.87
26.5	56	47	36.7	-4	57	13.1	14 44.1	53 59.35	+0.216	16.7	26	U	13	28.1	1.89
27.0	62	44	0.2	5	2	51.2	14 45.0	54 2.72	0.347	17.2	27	L	1	50.9	1.92
27.5	68	41	3.2	5	5	12.2	14 46.4	54 7.72	0.487	17.7	27	U	14	14.1	1.95
28.0	74	39	2.5	5	4	13.7	14 48.2	54 14.45	0.635	18.2	28	L	2	37.6	1.97
28.5	80	38	16.9	4	59	54.8	14 50.6	54 23.00	0.791	18.7	28	U	15	1.4	1.99
29.0	86	39	7.3	-4	52	15.6	14 53.4	54 33.47	+0.954	19.2	29	L	3	25.4	2.02
29.5	92	41	56.8	4	41	17.8	14 56.8	54 45.93	1.123	19.7	29	U	15	49.8	2.04
30.0	98	47	11.5	4	27	4.6	15 0.8	55 0.45	1.297	20.2	30	L	4	14.3	2.05
30.5	104	55	18.8	4	9	40.3	15 5.3	55 17.06	1.472	20.7	30	U	16	39.1	2.07
31.0	111	6	48.6	3	49	10.9	15 10.4	55 35.77	1.645	21.2	31	L	5	4.0	2.08
31.5	117	22	12.2	-3	25	44.0	15 16.1	55 56.53	+1.814	21.7	31	U	17	29.0	2.09
Nov. 1.0	123	42	1.7	2	59	29.4	15 22.2	56 19.27	1.973	22.2	Nov. 1	L	5	54.1	2.10
1.5	130	6	49.6	2	30	38.9	15 28.9	56 43.82	2.115	22.7	1	U	18	19.3	2.11
2.0	136	37	7.5	1	59	27.1	15 36.1	57 9.96	2.238	23.2	2	L	6	44.7	2.12
2.5	143	13	25.1	1	26	11.5	15 43.5	57 37.41	2.332	23.7	2	U	19	10.1	2.13
3.0	149	56	9.1	-0	51	13.1	15 51.3	58 5.78	+2.390	24.2	3	L	7	35.7	2.14
3.5	156	45	40.8	-0	14	57.0	15 59.1	58 34.60	2.406	24.7	3	U	20	1.4	2.15
4.0	163	42	15.0	+0	22	8.1	16 6.9	59 3.32	2.371	25.2	4	L	8	27.4	2.18
4.5	170	45	58.2	0	59	28.8	16 14.6	59 31.29	2.282	25.7	4	U	20	53.7	2.20
5.0	177	56	46.2	1	36	28.0	16 21.8	59 57.85	2.133	26.2	5	L	9	20.3	2.23
5.5	185	14	23.0	+2	12	25.3	16 28.4	60 22.24	+1.922	26.7	5	U	21	47.3	2.27
6.0	192	38	19.1	2	46	37.7	16 34.3	60 43.74	1.651	27.2	6	L	10	14.8	2.31
6.5	200	7	51.3	3	18	21.5	16 39.2	61 1.64	1.324	27.7	6	U	22	42.8	2.35
7.0	207	42	2.5	3	46	53.6	16 42.9	61 15.32	0.949	28.2	7	L	11	11.3	2.40
7.5	215	19	43.3	4	11	34.2	16 45.3	61 24.28	0.539	28.7	7	U	23	40.4	2.45
8.0	222	59	34.1	+4	31	48.7	16 46.4	61 28.17	+0.108	29.2	8	L	12	10.0	2.48
8.5	230	40	8.5	4	47	9.6	16 46.1	61 26.85	-0.327	0.4			...	...
9.0	238	19	57.2	4	57	18.1	16 44.3	61 20.36	0.751	0.9	9	U	0	40.0	2.51
9.5	245	57	32.0	5	2	5.0	16 41.2	61 8.95	1.145	1.4	9	L	13	10.3	2.53
10.0	253	31	31.0	5	1	30.8	16 36.8	60 53.05	1.497	1.9	10	U	1	40.7	2.54
10.5	261	0	41.0	+4	55	45.1	16 31.4	60 33.23	-1.797	2.4	10	L	14	11.1	2.53
11.0	268	24	1.3	4	45	5.2	16 25.2	60 10.15	2.039	2.9	11	U	2	41.3	2.50
11.5	275	40	45.0	4	29	54.9	16 18.2	59 44.53	2.219	3.4	11	L	15	11.1	2.46
12.0	282	50	19.4	4	10	42.3	16 10.7	59 17.13	2.337	3.9	12	U	3	40.3	2.40
12.5	289	52	26.6	3	47	58.5	16 2.9	58 48.66	2.398	4.4	12	L	16	8.7	2.34
13.0	296	47	1.3	+3	22	15.8	15 55.1	58 19.78	-2.407	4.9	13	U	4	36.4	2.27
13.5	303	34	10.3	2	54	6.4	15 47.3	57 51.09	2.368	5.4	13	L	17	3.2	2.20
14.0	310	14	9.6	2	24	1.7	15 39.6	57 23.11	2.290	5.9	14	U	5	29.2	2.13
14.5	316	47	23.0	1	52	31.4	15 32.3	56 56.26	2.180	6.4	14	L	17	54.3	2.06
15.0	323	14	20.1	1	20	3.6	15 25.4	56 30.88	2.047	6.9	15	U	6	18.6	1.99
15.5	329	35	34.6	+0	47	4.3	15 19.0	56 7.22	-1.893	7.4	15	L	18	42.2	1.94
16.0	335	51	42.5	+0	13	57.3	15 13.0	55 45.49	-1.728	7.9	16	U	7	5.2	1.89

GREENWICH MEAN TIME.

G. M. T.	Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.			Var. per Hour.
	° ' "	° ' "	' "	' "	"	d		h m	m	
Nov. 16.0	335 51 42.5	+0 13 57.3	15 13.0	55 45.49	-1.728	7.9	Nov. 16	U	7 5.2	1.89
16.5	342 3 20.8	-0 18 55.1	15 7.7	55 25.78	1.556	8.4	16	L	19 27.7	1.85
17.0	348 11 6.6	0 51 12.5	15 2.9	55 8.16	1.379	8.9	17	U	7 49.7	1.82
17.5	354 15 36.3	1 22 35.9	14 58.7	54 52.67	1.204	9.4	17	L	20 11.4	1.80
18.0	0 17 24.3	1 52 47.7	14 55.0	54 39.25	1.032	9.9	18	U	8 32.9	1.78
18.5	6 17 3.2	-2 21 31.2	14 51.9	54 27.88	-0.865	10.4	18	L	20 54.2	1.77
19.0	12 15 2.9	2 48 31.0	14 49.3	54 18.46	0.705	10.9	19	U	9 15.4	1.77
19.5	18 11 50.5	3 13 32.5	14 47.3	54 10.92	0.553	11.4	19	L	21 36.7	1.78
20.0	24 7 50.5	3 36 22.0	14 45.7	54 5.16	0.409	11.9	20	U	9 58.0	1.79
20.5	30 3 24.2	3 56 47.1	14 44.6	54 1.06	0.274	12.4	20	L	22 19.6	1.80
21.0	35 58 50.2	-4 14 35.8	14 43.9	53 58.55	-0.147	12.9	21	U	10 41.3	1.82
21.5	41 54 24.5	4 29 37.9	14 43.6	53 57.51	-0.027	13.4	21	L	23 3.4	1.85
22.0	47 50 20.7	4 41 44.1	14 43.7	53 57.87	+0.086	13.9	22	U	11 25.7	1.88
22.5	53 46 50.2	4 50 46.5	14 44.2	53 59.55	0.193	14.4	22	L	23 48.5	1.91
23.0	59 44 3.1	4 56 38.5	14 45.0	54 2.50	0.298	14.9	23	U	12 11.5	1.93
23.5	65 42 8.2	-4 59 15.6	14 46.1	54 6.69	+0.400	15.4			.....	...
24.0	71 41 13.8	4 58 34.5	14 47.6	54 12.09	0.501	15.9	24	L	0 34.9	1.96
24.5	77 41 28.2	4 54 34.1	14 49.4	54 18.71	0.603	16.4	24	U	12 58.6	1.99
25.0	83 43 0.0	4 47 14.8	14 51.5	54 26.56	0.706	16.9	25	L	1 22.6	2.01
25.5	89 45 59.0	4 36 39.0	14 54.0	54 35.66	0.812	17.4	25	U	13 46.9	2.03
26.0	95 50 36.3	-4 22 50.9	14 56.8	54 46.07	+0.924	17.9	26	L	2 11.4	2.05
26.5	101 57 5.2	4 5 56.6	15 0.1	54 57.84	1.038	18.4	26	U	14 36.1	2.06
27.0	108 5 40.7	3 46 4.0	15 3.7	55 11.00	1.157	18.9	27	L	3 0.8	2.06
27.5	114 16 40.6	3 23 22.7	15 7.6	55 25.62	1.280	19.4	27	U	15 25.6	2.07
28.0	120 30 25.0	2 58 4.3	15 12.0	55 41.72	1.404	19.9	28	L	3 50.4	2.07
28.5	126 47 16.2	-2 30 22.1	15 16.8	55 59.32	+1.530	20.4	28	U	16 15.2	2.06
29.0	133 7 38.9	2 0 31.5	15 22.0	56 18.42	1.653	20.9	29	L	4 39.9	2.06
29.5	139 31 59.2	1 28 49.7	15 27.6	56 38.96	1.770	21.4	29	U	17 4.7	2.06
30.0	146 0 44.4	0 55 36.3	15 33.6	57 0.86	1.877	21.9	30	L	5 29.4	2.06
30.5	152 34 21.8	-0 21 13.1	15 39.9	57 23.96	1.970	22.4	30	U	17 54.1	2.07
Dec. 1.0	159 18 18.1	+0 13 55.4	15 46.4	57 48.06	+2.042	22.9	Dec. 1	L	6 19.0	2.08
1.5	165 57 57.4	0 49 22.3	15 53.2	58 12.86	2.087	23.4	1	U	18 44.0	2.09
2.0	172 48 40.1	1 24 37.8	16 0.1	58 38.02	2.100	23.9	2	L	7 9.2	2.11
2.5	179 45 41.0	1 59 9.6	16 6.9	59 3.10	2.073	24.4	2	U	19 34.7	2.14
3.0	186 49 7.7	2 32 22.9	16 13.6	59 27.58	2.000	24.9	3	L	8 0.7	2.18
3.5	193 58 58.2	+3 3 41.1	16 19.9	59 50.89	+1.877	25.4	3	U	20 27.1	2.23
4.0	201 14 59.9	3 32 26.8	16 25.8	60 12.41	1.700	25.9	4	L	8 54.2	2.28
4.5	208 36 47.4	3 58 2.5	16 31.0	60 31.48	1.469	26.4	4	U	21 21.8	2.33
5.0	216 3 42.6	4 19 52.6	16 35.3	60 47.47	1.188	26.9	5	L	9 50.1	2.39
5.5	223 34 53.7	4 37 24.9	16 38.7	60 59.81	0.860	27.4	5	U	22 19.2	2.45
6.0	231 9 17.2	+4 50 12.3	16 40.9	61 7.96	+0.494	27.9	6	L	10 48.8	2.49
6.5	238 45 38.9	4 57 54.4	16 41.9	61 11.56	+0.102	28.4	6	U	23 19.0	2.54
7.0	246 22 37.8	5 0 19.5	16 41.6	61 10.37	-0.301	28.9	7	L	11 49.6	2.57
7.5	253 58 49.1	4 57 24.8	16 39.9	61 4.34	0.701	29.4			.....	...
8.0	261 32 48.3	4 49 16.8	16 37.0	60 53.61	1.083	0.4	8	U	0 20.5	2.57
8.5	269 3 15.7	+4 36 10.7	16 32.9	60 38.47	-1.433	0.9	8	L	12 51.3	2.56
9.0	276 28 59.7	+4 18 29.7	16 27.7	60 19.40	-1.738	1.4	9	U	1 21.9	2.53

GREENWICH MEAN TIME.

G. M. T.		Longitude.	Latitude.	Semi-diameter.	Horizontal Parallax.	Var. per Hour.	Age.	Transit, Meridian of Greenwich.				Var. per Hour.
		° ' "	° ' "	' "	' "	"	d			h m	m	
Dec.	9.0	276 28 59.7	+4 18 29.7	16 27.7	60 19.40	-1.738	1.4	Dec. 9	U	1 21.9	2.53	
	9.5	283 48 59.8	3 56 43.0	16 21.6	59 56.96	1.992	1.9	9	L	13 52.0	2.49	
	10.0	291 2 28.4	3 31 24.0	16 14.7	59 31.82	2.197	2.4	10	U	2 21.5	2.43	
	10.5	298 8 52.0	3 3 8.9	16 7.3	59 4.70	2.322	2.9	10	L	14 50.2	2.35	
	11.0	305 7 51.0	2 32 34.2	15 59.6	58 36.31	2.400	3.4	11	U	3 17.9	2.27	
	11.5	311 59 18.5	+2 0 16.0	15 51.7	58 7.32	-2.422	3.9	11	L	15 44.8	2.20	
	12.0	318 43 19.7	1 26 48.5	15 43.8	57 38.39	2.393	4.4	12	U	4 10.7	2.12	
	12.5	325 20 9.6	0 52 43.6	15 36.1	57 10.07	2.320	4.9	12	L	16 35.8	2.05	
	13.0	331 50 11.7	+0 18 30.2	15 28.7	56 42.85	2.210	5.4	13	U	5 0.0	1.99	
	13.5	338 13 55.4	-0 15 25.6	15 21.7	56 17.14	2.070	5.9	13	L	17 23.5	1.93	
	14.0	344 31 55.2	-0 48 40.4	15 15.2	55 53.27	-1.905	6.4	14	U	5 46.3	1.88	
	14.5	350 44 48.7	1 20 53.9	15 9.2	55 31.50	1.721	6.9	14	L	18 8.7	1.85	
	15.0	356 53 15.2	1 51 47.7	15 3.9	55 12.01	1.526	7.4	15	U	6 30.6	1.81	
	15.5	2 57 54.7	2 21 5.4	14 59.3	54 54.90	1.324	7.9	15	L	18 52.1	1.79	
	16.0	8 59 27.2	2 48 32.5	14 55.3	54 40.25	1.117	8.4	16	U	7 13.5	1.78	
	16.5	14 58 31.5	-3 13 55.7	14 52.0	54 28.08	-0.912	8.9	16	L	19 34.8	1.77	
	17.0	20 55 44.9	3 37 2.9	14 49.3	54 18.34	0.712	9.4	17	U	7 56.1	1.78	
	17.5	26 51 42.4	3 57 43.0	14 47.3	54 10.98	0.516	9.9	17	L	20 17.5	1.79	
	18.0	32 46 56.6	4 15 45.8	14 45.9	54 5.92	0.329	10.4	18	U	8 39.0	1.80	
	18.5	38 41 57.1	4 31 1.8	14 45.1	54 3.04	-0.153	10.9	18	L	21 0.8	1.82	
	19.0	44 37 10.8	-4 43 22.6	14 44.9	54 2.21	+0.012	11.4	19	U	9 22.8	1.85	
	19.5	50 33 1.2	4 52 40.3	14 45.2	54 3.29	0.165	11.9	19	L	21 45.3	1.88	
	20.0	56 29 48.6	4 58 48.3	14 46.0	54 6.13	0.306	12.4	20	U	10 8.0	1.91	
	20.5	62 27 50.3	5 1 41.3	14 47.2	54 10.58	0.433	12.9	20	L	22 31.2	1.95	
	21.0	68 27 20.7	5 1 15.1	14 48.8	54 16.48	0.548	13.4	21	U	10 54.8	1.98	
	21.5	74 28 31.3	-4 57 27.5	14 50.8	54 23.68	+0.650	13.9	21	L	23 18.8	2.01	
	22.0	80 31 31.2	4 50 17.5	14 53.0	54 32.03	0.741	14.4	22	U	11 43.1	2.04	
	22.5	86 36 27.7	4 39 46.6	14 55.6	54 41.43	0.823	14.9			.....	...
	23.0	92 43 26.6	4 25 58.4	14 58.4	54 51.74	0.895	15.4	23	L	0 7.7	2.06	
	23.5	98 52 32.3	4 8 58.4	15 1.4	55 2.88	0.960	15.9	23	U	12 32.6	2.08	
	24.0	105 3 49.2	-3 48 54.8	15 4.7	55 14.75	+1.019	16.4	24	L	0 57.6	2.09	
	24.5	111 17 21.5	3 25 58.1	15 8.1	55 27.32	1.075	16.9	24	U	13 22.7	2.09	
25.0	117 33 14.3	3 0 21.4	15 11.7	55 40.54	1.127	17.4	25	L	1 47.8	2.09		
25.5	123 51 33.6	2 32 19.8	15 15.5	55 54.37	1.178	17.9	25	U	14 12.8	2.08		
26.0	130 12 26.9	2 2 10.8	15 19.4	56 8.82	1.229	18.4	26	L	2 37.8	2.08		
26.5	136 36 3.4	-1 30 13.9	15 23.5	56 23.86	+1.279	18.9	26	U	15 2.6	2.07		
27.0	143 2 34.2	0 56 50.9	15 27.8	56 39.51	1.329	19.4	27	L	3 27.4	2.06		
27.5	149 32 12.0	-0 22 25.0	15 32.2	56 55.75	1.378	19.9	27	U	15 52.0	2.05		
28.0	156 5 11.1	+0 12 38.5	15 36.8	57 12.56	1.423	20.4	28	L	4 16.5	2.04		
28.5	162 41 47.0	0 47 52.8	15 41.5	57 29.88	1.463	20.9	28	U	16 41.0	2.04		
29.0	169 22 15.4	+1 22 49.8	15 46.3	57 47.65	+1.497	21.4	29	L	5 5.5	2.04		
29.5	176 6 51.7	1 57 0.0	15 51.3	58 5.75	1.518	21.9	29	U	17 30.1	2.06		
30.0	182 55 49.9	2 29 53.0	15 56.2	58 24.01	1.523	22.4	30	L	5 55.0	2.08		
30.5	189 49 20.9	3 0 57.5	16 1.2	58 42.23	1.509	22.9	30	U	18 20.1	2.11		
31.0	196 47 32.1	3 29 41.9	16 6.1	59 0.12	1.470	23.4	31	L	6 45.7	2.15		
31.5	203 50 25.3	+3 55 34.9	16 10.8	59 17.38	+1.401	23.9	31	U	19 11.7	2.19		
32.0	210 57 55.3	+4 18 6.1	16 15.2	59 33.61	+1.299	24.4	32	L	7 38.3	2.24		

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.																		
	h	m	s		°	'	"							h	m																
Jan.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	19 47 48.12	19 54 25.59	20 0 56.89	20 7 21.01	20 13 36.77	20 19 42.84	20 25 37.74	20 31 19.79	20 36 47.10	20 41 57.55	20 46 48.82	20 51 18.33	20 55 23.31	20 59 0.79	21 2 7.65	21 4 40.70	21 6 36.82	21 7 53.06	21 8 26.84	21 8 16.16	21 7 19.86	21 5 37.84	21 3 11.30	21 0 2.94	20 56 17.01	20 51 59.30	20 47 16.93	20 42 18.03	20 37 11.34	20 32 5.59	20 27 9.10
	16.677	16.439	16.162	15.840	15.465	+15.031	14.532	13.959	13.302	12.553	+11.701	10.739	9.656	8.446	7.104	+ 5.629	4.027	2.308	+ 0.493	- 1.391	- 3.302	5.192	7.001	8.666	10.121	-11.305	12.169	12.678	12.819	12.602	-12.054
	-23 14 36.5	22 54 11.1	22 32 20.8	22 9 9.1	21 44 40.5	-21 19 0.3	20 52 15.2	20 24 33.0	19 56 3.4	19 26 57.5	-18 57 28.6	18 27 51.5	17 58 23.5	17 29 23.8	17 1 13.5	-16 34 15.4	16 8 53.6	15 45 32.8	15 24 37.5	15 6 30.6	-14 51 32.9	14 40 0.9	14 32 6.2	14 27 53.8	14 27 21.8	-14 30 20.7	14 36 34.1	14 45 39.8	14 57 11.1	15 10 39.2	-15 25 34.4
	+49.25	52.85	56.32	59.62	62.72	+65.58	68.13	70.32	72.08	73.32	+73.99	73.98	73.22	71.61	69.09	+65.58	61.06	55.50	48.95	41.48	+33.22	24.37	15.16	+ 5.89	- 3.15	-11.64	19.32	25.96	31.44	35.69	-38.72
	0.095 6717	0.089 4416	0.082 8027	0.075 7340	0.068 2144	0.060 2227	0.051 7391	0.042 7452	0.033 2263	0.023 1714	0.012 5764	0.001 4451	9.989 7921	9.977 6460	9.965 0518	9.952 0747	9.938 8027	9.925 3489	9.911 8542	9.898 4863	9.885 4387	9.872 9260	9.861 1768	9.850 4232	9.840 8884	9.832 7722	9.826 2371	9.821 3967	9.818 3069	9.816 9644	9.817 3092
	-2513.6	2879.6	2854.3	3037.8	3230.1	-3431.0	3640.0	3855.9	4077.3	4302.0	-4526.9	4748.2	4960.7	5158.0	5332.6	-5475.5	5576.7	5625.0	5609.0	5517.5	-5340.6	5070.7	4704.1	4241.6	3690.0	-3062.1	2375.8	1654.0	921.1	- 201.8	+ 481.5
	2.68	2.71	2.75	2.80	2.86	2.91	2.96	3.02	3.09	3.17	3.25	3.33	3.42	3.52	3.62	3.73	3.84	3.96	4.09	4.22	4.35	4.47	4.59	4.71	4.82	4.91	4.98	5.04	5.08	5.10	5.09
	7.06	7.16	7.27	7.39	7.52	7.66	7.81	7.97	8.15	8.34	8.55	8.77	9.01	9.27	9.54	9.83	10.13	10.45	10.78	11.12	11.46	11.79	12.11	12.41	12.69	12.93	13.13	13.28	13.37	13.41	13.40
	1 7.5	1 10.2	1 12.7	1 15.2	1 17.5	1 19.7	1 21.6	1 23.4	1 24.9	1 26.1	1 27.0	1 27.5	1 27.6	1 27.3	1 26.4	1 25.0	1 22.9	1 20.2	1 16.8	1 12.7	1 7.8	1 2.1	0 55.7	0 48.7	0 41.0	0 32.8	0 24.2	0 15.3	0 6.8	23 48.5	23 39.9
Feb.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
	20 22 29.32	20 18 12.50	20 14 23.56	20 11 6.00	20 8 22.08	20 6 12.85	20 4 38.46	20 3 38.29	20 3 11.17	20 3 15.56	20 3 49.66	20 4 51.58	20 6 19.35	20 8 11.03	20 10 24.74	20 12 58.71	20 14 32.85	20 16 17.88	20 18 3.91	20 19 58.94	20 21 13.97	20 22 28.99	20 23 43.99	20 24 58.99	20 26 13.99	20 27 28.99	20 28 43.99	20 29 58.99	20 31 13.99	20 32 28.99	20 33 43.99
	11.218	10.149	8.905	7.542	- 6.111	4.657	3.214	1.809	- 0.462	+ 0.815	2.014	3.132	4.169	5.125	+ 6.005	+ 6.814	7.628	8.441	9.254	10.067	10.879	11.691	12.503	13.315	14.127	14.939	15.751	16.563	17.375	18.187	18.999
	15 41 28.5	15 57 55.5	16 14 32.8	16 31 0.9	-16 47 4.3	17 2 30.2	17 17 8.8	17 30 52.0	17 43 34.0	-17 55 10.2	18 5 36.9	18 14 51.5	18 22 51.8	18 29 36.3	-18 35 3.7	-18 39 13.1	-18 42 26.5	-18 45 39.9	-18 48 53.3	-18 52 6.7	-18 55 20.1	-18 58 33.5	-19 01 46.9	-19 04 60.3	-19 07 13.7	-19 10 27.1	-19 13 40.5	-19 16 53.9	-19 20 07.3	-19 23 20.7	-19 26 34.1
	40.61	41.49	41.48	40.75	-39.44	37.66	35.50	33.06	30.41	-27.58	24.63	21.57	18.44	15.26	-12.02	- 8.75	- 5.48	- 2.21	+ 1.06	+ 3.81	+ 6.56	+ 9.31	+ 12.06	+ 14.81	+ 17.56	+ 20.31	+ 23.06	+ 25.81	+ 28.56	+ 31.31	+ 34.06
	9.819 2323	9.822 5877	9.827 2055	9.832 9030	9.839 4978	9.846 8145	9.854 6914	9.862 9839	9.871 5657	9.880 3291	9.889 1842	9.898 0567	9.906 8865	9.915 6268	9.924 2396	9.932 6967	9.941 1538	9.949 6109	9.958 0680	9.966 5251	9.975 0822	9.983 5393	9.992 0964	10.000 6535	10.009 2106	10.017 7677	10.026 3248	10.034 7819	10.043 3390	10.051 8961	10.060 4532
	1110.8	1673.5	2161.9	2573.4	+2010.0	3176.0	3378.0	3523.6	3620.6	+3676.2	3697.9	3691.6	3663.4	3617.5	+3557.9	+3488.2	+3418.9	+3349.6	+3280.3	+3211.0	+3141.7	+3072.4	+3003.1	+2933.8	+2864.5	+2795.2	+2725.9	+2656.6	+2587.3	+2518.0	+2448.7
	5.07	5.03	4.98	4.91	4.83	4.75	4.66	4.57	4.49	4.40	4.31	4.22	4.14	4.06	3.98	3.90	3.82	3.74	3.66	3.58	3.50	3.42	3.34	3.26	3.18	3.10	3.02	2.94	2.86	2.78	2.70
	13.34	13.24	13.10	12.93	12.73	12.52	12.29	12.06	11.83	11.59	11.36	11.13	10.91	10.69	10.48	10.28	10.08	9.88	9.68	9.48	9.28	9.08	8.88	8.68	8.48	8.28	8.08	7.88	7.68	7.48	7.28
	23 31.7	23 24.0	23 16.8	23 10.2	23 4.1	22 58.6	22 53.6	22 49.2	22 45.3	22 41.9	22 39.0	22 36.5	22 34.4	22 32.6	22 31.2	22 30.2	22 29.2	22 28.2	22 27.2	22 26.2	22 25.2	22 24.2	22 23.2	22 22.2	22 21.2	22 20.2	22 19.2	22 18.2	22 17.2	22 16.2	22 15.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Feb. 16	20 12 58.71	+ 6.814	-18 39 13.1	- 8.75	9.932 6967	+3488.2	3.90	10.28	22 30.2
17	20 15 51.25	7.554	18 42 3.6	5.46	9.940 9767	3410.8	3.83	10.08	22 29.4
18	20 19 0.80	8.232	18 43 34.8	- 2.14	9.949 0642	3328.1	3.76	9.89	22 28.8
19	20 22 25.91	8.852	18 43 46.2	+ 1.19	9.956 9491	3242.1	3.69	9.72	22 28.5
20	20 26 5.25	9.418	18 42 37.4	4.54	9.964 6245	3153.8	3.63	9.55	22 28.4
21	20 29 57.58	+ 9.936	-18 40 8.3	+ 7.89	9.972 0865	+3064.5	3.56	9.39	22 28.5
22	20 34 1.82	10.409	18 36 18.7	11.21	9.979 3342	2975.3	3.50	9.23	22 28.8
23	20 38 16.89	10.842	18 31 8.7	14.59	9.986 3684	2886.7	3.45	9.08	22 29.3
24	20 42 41.93	11.239	18 24 38.3	17.94	9.993 1910	2799.0	3.40	8.94	22 29.9
25	20 47 16.07	11.601	18 16 47.4	21.30	9.999 8050	2713.0	3.34	8.80	22 30.7
26	20 51 58.55	+11.931	-18 7 36.1	+ 24.64	0.006 2148	+2628.8	3.29	8.67	22 31.6
27	20 56 48.69	12.210	17 57 4.7	27.98	0.012 4249	2546.6	3.24	8.55	22 32.6
28	21 1 45.87	12.521	17 45 13.2	31.31	0.018 4401	2466.4	3.20	8.43	22 33.7
Mar. 1	21 6 49.51	12.779	17 32 1.9	34.63	0.024 2656	2388.5	3.15	8.32	22 34.9
2	21 11 59.12	13.018	17 17 31.0	37.91	0.029 9067	2312.7	3.11	8.21	22 36.2
3	21 17 14.25	+13.239	-17 1 40.9	+ 41.21	0.035 3683	+2239.0	3.07	8.11	22 37.6
4	21 22 34.48	13.444	16 44 31.4	44.54	0.040 6557	2167.5	3.04	8.01	22 39.1
5	21 27 59.44	13.634	16 26 3.3	47.81	0.045 7737	2097.9	3.00	7.92	22 40.6
6	21 33 28.83	13.812	16 6 16.7	51.08	0.050 7269	2030.1	2.97	7.83	22 42.2
7	21 39 2.32	13.978	15 45 11.8	54.32	0.055 5197	1964.2	2.94	7.75	22 43.9
8	21 44 39.70	+14.134	-15 22 49.4	+ 57.55	0.060 1562	+1899.9	2.91	7.67	22 45.6
9	21 50 20.69	14.281	14 59 9.4	60.78	0.064 6403	1837.1	2.88	7.59	22 47.4
10	21 56 5.14	14.421	14 34 12.3	63.98	0.068 9755	1775.7	2.85	7.51	22 49.3
11	22 1 52.86	14.554	14 7 58.6	67.16	0.073 1648	1715.5	2.82	7.44	22 51.2
12	22 7 43.70	14.682	13 40 28.6	70.33	0.077 2109	1656.4	2.80	7.37	22 53.2
13	22 13 37.55	+14.805	-13 11 42.7	+ 73.49	0.081 1165	+1598.3	2.77	7.30	22 55.2
14	22 19 34.31	14.925	12 41 41.3	76.62	0.084 8834	1540.8	2.75	7.24	22 57.2
15	22 25 33.91	15.042	12 10 25.0	79.74	0.088 5127	1483.8	2.73	7.18	22 59.3
16	22 31 36.31	15.157	11 37 54.0	82.81	0.092 0061	1427.3	2.71	7.12	23 1.4
17	22 37 41.45	15.272	11 4 9.1	85.91	0.095 3638	1370.6	2.68	7.06	23 3.6
18	22 43 49.35	+15.387	-10 29 10.4	+ 88.97	0.098 5849	+1313.8	2.66	7.01	23 5.9
19	22 50 0.01	15.502	9 52 58.7	92.00	0.101 6696	1256.7	2.64	6.96	23 8.2
20	22 56 13.45	15.618	9 15 34.6	95.01	0.104 6165	1198.9	2.62	6.91	23 10.5
21	23 2 29.71	15.737	8 36 58.5	97.99	0.107 4237	1140.1	2.60	6.87	23 12.9
22	23 8 48.86	15.859	7 57 11.1	100.95	0.110 0880	1080.0	2.59	6.83	23 15.3
23	23 15 10.98	+15.985	- 7 16 13.2	+103.87	0.112 6065	+1018.3	2.57	6.79	23 17.8
24	23 21 36.15	16.114	6 34 5.5	106.76	0.114 9742	951.5	2.56	6.75	23 20.3
25	23 28 4.48	16.248	5 50 49.0	* 109.61	0.117 1864	888.5	2.55	6.72	23 22.9
26	23 34 36.07	16.386	5 6 24.7	112.41	0.119 2366	819.6	2.54	6.69	23 25.5
27	23 41 11.07	16.531	4 20 53.7	115.16	0.121 1177	747.4	2.52	6.66	23 28.2
28	23 47 49.61	+16.681	- 3 34 17.3	+117.86	0.122 8210	+ 671.5	2.51	6.63	23 31.0
29	23 54 31.81	16.837	2 46 37.0	120.48	0.124 3375	591.4	2.50	6.61	23 33.8
30	0 1 17.85	17.000	1 57 55.0	123.01	0.125 6559	506.5	2.50	6.59	23 36.7
31	0 8 7.84	17.168	1 8 13.0	125.47	0.126 7642	416.1	2.49	6.57	23 39.7
Apr. 1	0 15 1.95	17.342	- 0 17 33.4	127.81	0.127 6486	319.8	2.49	6.56	23 42.7
2	0 22 0.28	+17.521	+ 0 34 0.8	+130.02	0.128 2942	+ 217.0	2.48	6.55	23 45.8
3	0 29 2.98	+17.704	+ 1 26 26.4	+132.09	0.128 6844	+ 106.8	2.48	6.54	23 49.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
Apr.	1	0	15	1.95	+17.342	-	0 17 33.4	+127.81	0.127 6486	+ 319.8	2.49	6.56	23	42.7
	2	0	22	0.28	17.521	+	0 34 0.8	130.02	0.128 2942	217.0	2.48	6.55	23	45.8
	3	0	29	2.98	17.704	1	26 26.4	132.09	0.128 6844	+ 106.8	2.48	6.54	23	49.0
	4	0	36	10.11	17.891	2	19 39.6	133.98	0.128 8008	- 11.1	2.48	6.54	23	52.3
	5	0	43	21.75	18.079	3	13 35.8	135.67	0.128 6245	137.4	2.48	6.54	23	55.6
	6	0	50	37.91	+18.267	+	4 8 9.8	+137.13	0.128 1340	- 272.8	2.49	6.55	23	59.0
	7	0	57	58.55	18.452	5	3 15.9	138.33	0.127 3078	417.3	2.49	6.56	. . . .
	8	1	5	23.59	18.633	5	58 47.1	139.22	0.126 1231	571.6	2.50	6.58	0	2.5
	9	1	12	52.86	18.804	6	54 35.9	139.78	0.124 5562	735.8	2.50	6.61	0	6.1
	10	1	20	26.08	18.962	7	50 33.6	139.96	0.122 5837	909.7	2.51	6.64	0	9.7
	11	1	28	2.92	+19.104	+	8 46 30.7	+139.72	0.120 1823	-1093.0	2.53	6.67	0	13.4
	12	1	35	42.90	19.224	9	42 16.8	139.04	0.117 3303	1285.1	2.55	6.72	0	17.1
	13	1	43	25.46	19.318	10	37 40.6	137.87	0.114 0072	1485.3	2.57	6.77	0	20.9
	14	1	51	9.91	19.380	11	32 30.3	136.18	0.110 1954	1692.2	2.59	6.83	0	24.7
	15	1	58	55.40	19.405	12	26 33.0	133.96	0.105 8803	1904.4	2.62	6.90	0	28.5
	16	2	6	41.05	+19.391	+13	19 36.0	+131.20	0.101 0514	-2120.1	2.65	6.98	0	32.3
	17	2	14	25.80	19.331	14	11 26.6	127.92	0.095 7027	2337.1	2.68	7.06	0	36.1
	18	2	22	8.56	19.224	15	1 52.0	124.11	0.089 8338	2553.4	2.72	7.16	0	39.9
	19	2	29	48.14	19.066	15	50 40.2	119.82	0.083 4485	2766.9	2.76	7.26	0	43.7
	20	2	37	23.33	18.858	16	37 39.8	115.08	0.076 5567	2975.3	2.80	7.38	0	47.3
	21	2	44	52.88	+18.596	+17	22 40.8	+109.94	0.069 1727	-3176.6	2.85	7.50	0	50.9
	22	2	52	15.55	18.285	18	5 34.0	104.45	0.061 3159	3369.1	2.90	7.64	0	54.3
	23	2	59	30.15	17.923	18	46 12.2	98.69	0.053 0090	3551.4	2.96	7.79	0	57.6
	24	3	6	35.50	17.515	19	24 29.1	92.89	0.044 2784	3722.0	3.01	7.95	1	0.7
	25	3	13	30.49	17.060	20	0 20.2	86.54	0.035 1532	3880.3	3.07	8.11	1	3.7
	26	3	20	14.06	+16.564	+20	33 42.3	+ 80.28	0.025 6635	-4025.5	3.14	8.29	1	6.5
	27	3	26	45.25	16.028	21	4 33.4	73.97	0.015 8413	4157.4	3.22	8.48	1	9.1
	28	3	33	3.12	15.455	21	32 52.8	67.65	0.005 7189	4275.6	3.30	8.69	1	11.4
	29	3	39	6.83	14.848	21	58 40.6	61.35	9.995 3290	4380.4	3.38	8.90	1	13.5
	30	3	44	55.58	14.210	22	21 57.9	55.11	9.984 7039	4471.5	3.46	9.12	1	15.4
May	1	3	50	28.66	+13.542	+22	42 46.4	+ 48.95	9.973 8763	-4549.3	3.55	9.35	1	17.0
	2	3	55	45.36	12.846	23	1 8.3	42.89	9.962 8778	4613.8	3.64	9.59	1	18.3
	3	4	0	45.05	12.124	23	17 6.1	36.95	9.951 7406	4665.1	3.73	9.83	1	19.3
	4	4	5	27.11	11.378	23	30 42.8	31.13	9.940 4961	4703.1	3.83	10.09	1	20.1
	5	4	9	50.99	10.609	23	42 1.4	25.44	9.929 1765	4727.8	3.93	10.36	1	20.5
	6	4	13	56.15	+ 9.818	+23	51 4.9	+ 19.88	9.917 8138	-4738.9	4.04	10.64	1	20.6
	7	4	17	42.09	9.007	23	57 56.5	14.45	9.906 4412	4736.0	4.15	10.92	1	20.4
	8	4	21	8.34	8.178	24	2 39.3	9.14	9.895 0926	4718.8	4.25	11.21	1	19.9
	9	4	24	14.48	7.332	24	5 16.3	+ 3.96	9.883 8031	4686.5	4.36	11.50	1	19.1
	10	4	27	0.15	6.472	24	5 50.5	- 1.09	9.872 6099	4638.5	4.47	11.80	1	17.9
	11	4	29	25.03	+ 5.600	+24	4 24.9	- 6.02	9.861 5515	-4574.0	4.59	12.10	1	16.3
	12	4	31	28.89	4.720	24	1 2.6	10.82	9.850 6689	4491.9	4.71	12.41	1	14.4
	13	4	33	11.57	3.836	23	55 46.4	15.51	9.840 0049	4391.5	4.83	12.72	1	12.2
	14	4	34	33.03	2.952	23	48 39.4	20.06	9.829 6051	4271.6	4.94	13.03	1	9.6
	15	4	35	33.33	2.074	23	39 44.9	24.46	9.819 5173	4131.3	5.06	13.33	1	6.6
	16	4	36	12.67	+ 1.207	+23	29 6.6	- 28.71	9.809 7917	-3969.8	5.18	13.63	1	3.3
17	4	36	31.43	+ 0.360	+23	16 48.4	- 32.78	9.800 4799	-3786.3	5.29	13.93	0	59.7	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
May 17	4 36 31.43	+ 0.360	+23 16 48.4	-32.78	9.800 4799	-3786.3	5.29	13.93	0 59.7
18	4 36 30.14	- 0.462	23 2 54.8	36.65	9.791 6356	3580.2	5.40	14.21	0 55.7
19	4 36 9.52	1.250	22 47 31.0	40.29	9.783 3135	3351.0	5.50	14.49	0 51.5
20	4 35 30.50	1.994	22 30 43.0	43.66	9.775 5687	3099.3	5.60	14.75	0 46.9
21	4 34 34.23	2.686	22 12 37.8	46.72	9.768 4549	2825.2	5.69	15.00	0 42.0
22	4 33 22.07	- 3.317	+21 53 23.4	-49.42	9.762 0249	-2529.8	5.77	15.22	0 36.9
23	4 31 55.59	3.878	21 33 8.8	51.72	9.756 3280	2214.4	5.85	15.42	0 31.5
24	4 30 16.57	4.361	21 12 4.6	53.56	9.751 4104	1881.0	5.93	15.60	0 25.9
25	4 28 26.95	4.759	20 50 22.0	54.90	9.747 3115	1532.4	5.98	15.75	0 20.2
26	4 26 28.87	5.066	20 28 13.7	55.70	9.744 0651	1171.2	6.02	15.87	0 14.3
27	4 24 24.55	- 5.278	+20 5 53.2	-55.92	9.741 6970	- 801.1	6.05	15.95	0 8.3
28	4 22 16.31	5.392	19 43 34.5	55.54	9.740 2241	425.8	6.07	16.01	0 2.2
29	4 20 6.50	5.409	19 21 32.3	54.54	9.739 6545	- 49.0	6.08	16.03	23 50.1
30	4 17 57.47	5.328	19 0 1.3	52.94	9.739 9869	+ 325.2	6.08	16.02	23 44.1
31	4 15 51.50	5.154	18 39 16.0	50.74	9.741 2100	692.7	6.06	15.97	23 38.1
June 1	4 13 50.77	- 4.892	+18 19 30.3	-47.98	9.743 3039	+1050.3	6.03	15.89	23 32.3
2	4 11 57.33	4.548	18 0 57.3	44.69	9.746 2407	1394.5	5.99	15.78	23 26.7
3	4 10 13.07	4.129	17 43 48.8	40.94	9.749 9845	1722.5	5.94	15.65	23 21.2
4	4 8 39.66	3.644	17 28 15.2	36.79	9.754 4942	2032.4	5.88	15.49	23 15.9
5	4 7 18.61	3.101	17 14 25.5	32.30	9.759 7238	2322.1	5.81	15.31	23 10.9
6	4 6 11.18	- 2.510	+17 2 26.9	-27.55	9.765 6234	+2590.6	5.73	15.10	23 6.1
7	4 5 18.47	1.877	16 52 24.9	22.59	9.772 1414	2837.4	5.64	14.87	23 1.5
8	4 4 41.35	1.211	16 44 23.6	17.51	9.779 2252	3062.1	5.55	14.63	22 57.2
9	4 4 20.54	- 0.519	16 38 25.1	12.36	9.786 8219	3264.9	5.45	14.38	22 53.2
10	4 4 16.58	+ 0.192	16 34 30.4	7.21	9.794 8797	3446.4	5.35	14.11	22 49.5
11	4 4 29.85	+ 0.916	+16 32 38.8	- 2.10	9.803 3481	+3607.3	5.25	13.84	22 46.0
12	4 5 0.63	1.650	16 32 48.8	+ 2.91	9.812 1792	3748.7	5.14	13.56	22 42.9
13	4 5 49.10	2.389	16 34 57.2	7.77	9.821 3272	3871.7	5.04	13.28	22 40.0
14	4 6 55.32	3.130	16 39 0.6	12.48	9.830 7493	3977.2	4.93	12.99	22 37.5
15	4 8 19.33	3.870	16 44 54.7	16.98	9.840 4049	4066.7	4.83	12.70	22 35.2
16	4 10 1.07	+ 4.608	+16 52 34.0	+21.26	9.850 2573	+4141.2	4.72	12.42	22 33.3
17	4 12 0.48	5.342	17 1 53.1	25.29	9.860 2715	4201.8	4.61	12.14	22 31.6
18	4 14 17.46	6.072	17 12 45.8	29.06	9.870 4156	4249.6	4.50	11.86	22 30.2
19	4 16 51.92	6.798	17 25 5.6	32.55	9.880 6600	4285.6	4.39	11.58	22 29.1
20	4 19 43.75	7.520	17 38 45.8	35.75	9.890 9775	4310.5	4.29	11.31	22 28.3
21	4 22 52.86	+ 8.238	+17 53 39.3	+38.66	9.901 3422	+4325.1	4.19	11.04	22 27.8
22	4 26 19.15	8.952	18 9 38.8	41.25	9.911 7302	4330.1	4.09	10.78	22 27.5
23	4 30 2.55	9.664	18 26 36.7	43.52	9.922 1192	4325.9	3.99	10.53	22 27.6
24	4 34 3.02	10.375	18 44 25.3	45.47	9.932 4872	4312.8	3.90	10.28	22 27.9
25	4 38 20.52	11.084	19 2 56.5	47.08	9.942 8136	4291.1	3.81	10.04	22 28.5
26	4 42 55.04	+11.793	+19 22 2.2	+48.34	9.953 0779	+4261.1	3.72	9.80	22 29.4
27	4 47 46.57	12.502	19 41 33.7	49.23	9.963 2600	4222.6	3.63	9.58	22 30.6
28	4 52 55.12	13.211	20 1 22.3	49.75	9.973 3395	4175.6	3.55	9.36	22 32.1
29	4 58 20.69	13.920	20 21 18.5	49.87	9.983 2959	4119.9	3.47	9.15	22 33.8
30	5 4 3.28	14.629	20 41 13.0	49.60	9.993 1079	4055.2	3.40	8.94	22 35.9
July 1	5 10 2.88	+15.337	+21 0 55.8	+48.90	0.002 7538	+3981.5	3.32	8.74	22 38.2
2	5 16 19.45	+16.042	+21 20 16.4	+47.75	0.012 2114	+3998.0	3.25	8.55	22 40.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	5	10	2.88	+15.337	+21	0	55.8	+ 48.90	0.002 7538	+3981.5	3.32	8.74 22 38.2
	2	5	16	19.45	16.042	21	20	16.4	47.75	0.012 2114	3808.0	3.25	8.55 22 40.8
	3	5	22	52.87	16.742	21	39	4.0	46.14	0.021 4563	3804.5	3.18	8.37 22 43.7
	4	5	29	43.00	17.434	21	57	7.4	44.06	0.030 4645	3700.6	3.11	8.20 22 46.8
	5	5	36	49.59	18.113	22	14	15.1	41.50	0.039 2104	3585.8	3.05	8.04 22 50.3
	6	5	44	12.31	+18.777	+22	30	15.2	+ 38.42	0.047 6677	+3460.0	2.99	7.88 22 54.0
	7	5	51	50.69	19.418	22	44	55.5	34.85	0.055 8096	3323.0	2.93	7.74 22 57.9
	8	5	59	44.13	20.030	22	58	4.1	30.78	0.063 6089	3174.6	2.88	7.60 23 2.1
	9	6	7	51.85	20.607	23	9	29.0	26.21	0.071 0387	3015.1	2.83	7.47 23 6.5
	10	6	16	12.93	21.142	23	18	58.4	21.17	0.078 0728	2844.9	2.79	7.35 23 11.1
	11	6	24	46.26	+21.627	+23	26	21.5	+ 15.69	0.084 6865	+2664.9	2.75	7.24 23 15.9
	12	6	33	30.55	22.054	23	31	28.1	9.80	0.090 8575	2476.2	2.72	7.14 23 20.9
	13	6	42	24.35	22.418	23	34	9.4	+ 3.59	0.096 5663	2279.9	2.68	7.05 23 26.0
	14	6	51	26.07	22.713	23	34	18.0	- 2.91	0.101 7966	2077.9	2.64	6.96 23 31.2
	15	7	0	34.01	22.936	23	31	48.0	9.61	0.106 5369	1871.9	2.61	6.89 23 36.5
	16	7	9	46.40	+23.084	+23	26	35.6	- 16.43	0.110 7803	+1664.1	2.59	6.82 23 41.8
	17	7	19	1.42	23.156	23	18	39.0	23.29	0.114 5245	1456.3	2.56	6.76 23 47.2
	18	7	28	17.31	23.156	23	7	58.0	30.11	0.117 7723	1250.7	2.54	6.71 23 52.5
	19	7	37	32.34	23.085	22	54	34.7	36.81	0.120 5310	1049.1	2.52	6.67 23 57.8
	20	7	46	44.88	22.950	22	38	32.8	43.32	0.122 8123	853.0	2.51	6.63
	21	7	55	53.46	+22.756	+22	19	57.4	- 49.58	0.124 6313	+ 664.1	2.50	6.60 0 3.0
	22	8	4	56.74	22.510	21	58	55.1	55.56	0.126 0065	483.3	2.49	6.58 0 8.1
	23	8	13	53.58	22.220	21	35	33.3	61.20	0.126 9581	311.3	2.49	6.57 0 13.1
	24	8	22	42.99	21.892	21	10	0.4	66.49	0.127 5081	+ 148.6	2.49	6.56 0 18.0
	25	8	31	24.17	21.535	20	42	25.0	71.40	0.127 6792	- 4.4	2.49	6.56 0 22.8
	26	8	39	56.49	+21.155	+20	12	56.2	- 75.94	0.127 4944	- 148.0	2.49	6.56 0 27.4
	27	8	48	19.48	20.758	19	41	43.1	80.10	0.126 9762	282.3	2.49	6.57 0 31.8
	28	8	56	32.78	20.350	19	8	54.5	83.89	0.126 1467	407.6	2.49	6.58 0 36.1
	29	9	4	36.21	19.935	18	34	39.2	87.32	0.125 0267	524.4	2.50	6.60 0 40.3
	30	9	12	29.62	19.516	17	59	5.8	90.41	0.123 6361	633.2	2.51	6.62 0 44.2
	31	9	20	13.00	+19.099	+17	22	22.2	- 93.17	0.121 9931	- 734.8	2.52	6.64 0 48.0
Aug.	1	9	27	46.41	18.686	16	44	36.1	95.62	0.120 1145	829.6	2.53	6.67 0 51.6
	2	9	35	9.95	18.277	16	5	54.7	97.78	0.118 0158	918.4	2.54	6.70 0 55.1
	3	9	42	23.76	17.875	15	26	24.8	99.66	0.115 7108	1001.6	2.56	6.74 0 58.4
	4	9	49	28.04	17.482	14	46	12.8	101.29	0.113 2122	1079.9	2.57	6.78 1 1.5
	5	9	56	22.99	+17.098	+14	5	24.6	-102.69	0.110 5308	-1153.9	2.59	6.82 1 4.5
	6	10	3	8.84	16.724	13	24	5.7	103.85	0.107 6768	1223.9	2.60	6.86 1 7.3
	7	10	9	45.84	16.360	12	42	21.3	104.81	0.104 6585	1290.8	2.62	6.91 1 9.9
	8	10	16	14.21	16.006	12	0	16.2	105.58	0.101 4833	1354.8	2.64	6.96 1 12.5
	9	10	22	34.20	15.661	11	17	55.1	106.15	0.098 1575	1416.3	2.67	7.02 1 14.9
	10	10	28	46.04	+15.327	+10	35	22.1	-106.57	0.094 6865	-1475.9	2.69	7.07 1 17.1
	11	10	34	49.95	15.001	9	52	41.1	106.82	0.091 0745	1533.9	2.71	7.13 1 19.2
	12	10	40	46.15	14.684	9	9	56.0	106.91	0.087 3249	1590.6	2.74	7.19 1 21.2
	13	10	46	34.83	14.375	8	27	10.4	106.87	0.083 4406	1646.2	2.76	7.26 1 23.1
	14	10	52	16.19	14.073	7	44	27.5	106.68	0.079 4235	1701.3	2.78	7.33 1 24.8
	15	10	57	50.37	+13.777	+ 7	1	50.7	-106.36	0.075 2749	-1755.8	2.81	7.40 1 26.5
	16	11	3	17.54	+13.488	+ 6	19	23.1	-105.92	0.070 9958	-1810.2	2.84	7.47 1 28.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	h	m	s		°	'	"							h	m
	h	m	s	s	°	'	"	"					
Aug. 16	11	3	17.54	+13.488	+6	19	23.1	-105.92	0.070 9958	-1810.2	2.84	7.47	1 28.0
17	11	8	37.82	13.203	5	37	7.6	105.35	0.066 5860	1864.6	2.87	7.55	1 29.3
18	11	13	51.30	12.922	4	55	7.2	104.66	0.062 0453	1919.3	2.89	7.63	1 30.6
19	11	18	58.09	12.644	4	13	24.8	103.86	0.057 3729	1974.4	2.92	7.71	1 31.8
20	11	23	58.23	12.368	3	32	3.1	102.93	0.052 5679	2029.9	2.95	7.79	1 32.9
21	11	28	51.77	+12.093	+2	51	5.1	-101.89	0.047 6286	-2086.3	2.99	7.88	1 33.8
22	11	33	38.70	11.818	2	10	33.4	100.73	0.042 5530	2143.6	3.02	7.97	1 34.6
23	11	38	19.02	11.542	1	30	31.0	99.45	0.037 3386	2201.5	3.06	8.07	1 35.3
24	11	42	52.68	11.263	0	51	0.7	98.05	0.031 9833	2261.1	3.10	8.17	1 36.0
25	11	47	19.60	10.980	+0	12	5.5	96.53	0.026 4842	2321.6	3.14	8.28	1 36.5
26	11	51	39.66	+10.691	-0	26	11.6	-94.88	0.020 8385	-2383.4	3.18	8.39	1 36.8
27	11	55	52.73	10.396	1	3	47.4	93.09	0.015 0431	2446.4	3.23	8.50	1 37.1
28	11	59	58.60	10.092	1	40	38.5	91.15	0.009 0950	2510.6	3.27	8.62	1 37.3
29	12	3	57.06	9.778	2	16	41.4	89.07	0.002 9912	2576.1	3.32	8.74	1 37.3
30	12	7	47.84	9.451	2	51	52.5	86.82	9.996 7289	2642.7	3.37	8.87	1 37.2
31	12	11	30.60	+9.110	-3	26	7.6	-81.41	9.990 3056	-2710.3	3.42	9.00	1 36.9
Sept. 1	12	15	4.99	8.753	3	59	22.6	81.81	9.983 7189	2778.8	3.47	9.14	1 36.5
2	12	18	30.58	8.376	4	31	32.8	79.01	9.976 9672	2847.7	3.52	9.28	1 36.0
3	12	21	46.88	7.978	5	2	33.2	75.99	9.970 0497	2916.9	3.57	9.43	1 35.3
4	12	24	53.35	7.557	5	32	18.3	72.73	9.962 9665	2985.7	3.63	9.58	1 34.5
5	12	27	49.38	+7.108	-6	0	42.3	-69.22	9.955 7191	-3053.6	3.69	9.74	1 33.5
6	12	30	34.29	6.629	6	27	38.5	65.42	9.948 3105	3119.9	3.76	9.91	1 32.3
7	12	33	7.32	6.118	6	53	0.1	61.32	9.940 7457	3183.6	3.83	10.09	1 30.9
8	12	35	27.66	5.571	7	16	39.2	56.88	9.933 0323	3243.5	3.90	10.27	1 29.2
9	12	37	34.41	4.985	7	38	27.4	52.07	9.925 1807	3298.5	3.97	10.46	1 27.4
10	12	39	26.61	+4.357	-7	58	15.4	-46.86	9.917 2053	-3346.4	4.04	10.65	1 25.3
11	12	41	3.20	3.685	8	15	53.1	11.21	9.909 1252	3385.5	4.11	10.85	1 23.0
12	12	42	23.11	2.966	8	31	9.5	35.08	9.900 9641	3413.3	4.19	11.05	1 20.4
13	12	43	25.18	2.199	8	43	53.0	28.15	9.892 7529	3426.7	4.27	11.26	1 17.4
14	12	44	8.28	1.384	8	53	50.8	21.27	9.884 5300	3422.5	4.35	11.48	1 14.2
15	12	44	31.23	+0.521	-9	0	49.6	-13.53	9.876 3421	-3396.8	4.44	11.70	1 10.6
16	12	44	32.95	-0.385	9	4	35.6	-5.21	9.868 2460	3345.1	4.53	11.92	1 6.7
17	12	44	12.42	1.331	9	4	54.8	+3.71	9.860 3101	3282.6	4.61	12.14	1 2.4
18	12	43	28.79	2.309	9	1	33.2	13.19	9.852 6146	3143.8	4.69	12.36	0 57.8
19	12	42	21.46	3.304	8	54	17.9	23.17	9.845 2532	2983.3	4.77	12.57	0 52.7
20	12	40	50.16	-4.303	-8	42	57.5	+33.59	9.838 3327	-2775.4	4.85	12.77	0 47.2
21	12	38	55.04	5.285	8	27	23.1	44.31	9.831 9733	2514.7	4.92	12.96	0 41.4
22	12	36	36.80	6.226	8	7	29.8	55.13	9.826 3068	2197.4	4.98	13.13	0 35.2
23	12	33	56.77	7.096	7	43	17.8	65.82	9.821 4739	1819.8	5.04	13.27	0 28.6
24	12	30	57.03	7.863	7	14	53.9	76.07	9.817 6205	1381.2	5.09	13.39	0 21.7
25	12	27	40.44	-8.494	-6	42	32.7	+85.53	9.814 8915	-883.3	5.12	13.48	0 14.5
26	12	24	10.70	8.954	6	6	37.9	93.81	9.813 4241	-331.0	5.13	13.52	0 7.1
27	12	20	32.27	9.212	5	27	42.2	100.53	9.813 3392	+267.0	5.13	13.53	23 51.9
28	12	16	50.31	9.245	4	46	27.9	105.31	9.814 7325	898.5	5.12	13.48	23 44.4
29	12	13	10.48	9.033	4	3	45.1	107.86	9.817 6668	1548.4	5.09	13.39	23 36.9
30	12	9	38.72	-8.572	-3	20	30.3	+107.96	9.822 1656	+2199.3	5.03	13.25	23 29.7
Oct. 1	12	6	21.00	-7.865	-2	37	43.3	+105.53	9.828 2092	+2832.5	4.96	13.07	23 22.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h m	
Oct.	1	12	6	21.00	- 7.865	- 2	37	43.3	+105.53	9.828 2092	+2832.5	4.96	13.07	23 22.8
	2	12	3	23.05	6.929	1	56	24.6	100.62	9.835 7331	3430.1	4.88	12.85	23 16.4
	3	12	0	50.03	5.792	1	17	32.0	93.40	9.844 6325	3976.2	4.78	12.58	23 10.4
	4	11	58	46.39	4.487	0	41	57.8	84.13	9.854 7667	4457.3	4.67	12.29	23 4.9
	5	11	57	15.66	3.056	- 0	10	27.0	73.19	9.865 9681	4864.1	4.55	11.98	23 0.0
	6	11	56	20.36	- 1.541	+ 0	16	25.0	+ 60.96	9.878 0503	+5191.0	4.42	11.65	22 55.8
	7	11	56	2.02	+ 0.016	0	38	12.0	47.85	9.890 8194	5436.3	4.29	11.31	22 52.1
	8	11	56	21.15	1.575	0	54	37.7	34.24	9.904 0803	5601.5	4.16	10.97	22 49.1
	9	11	57	17.38	3.103	1	5	34.7	20.51	9.917 6461	5691.3	4.03	10.64	22 46.7
	10	11	58	49.61	4.570	1	11	3.9	+ 6.97	9.931 3433	5712.2	3.91	10.31	22 44.8
	11	12	0	56.07	+ 5.953	+ 1	11	12.8	- 6.14	9.945 0156	+5671.9	3.79	9.99	22 43.5
	12	12	3	34.55	7.236	1	6	14.5	18.60	9.958 5267	5579.4	3.67	9.68	22 42.7
	13	12	6	42.49	8.407	0	56	26.5	30.26	9.971 7618	5443.4	3.57	9.39	22 42.3
	14	12	10	17.17	9.463	0	42	9.2	41.02	9.984 6271	5272.7	3.47	9.12	22 42.3
	15	12	14	15.79	10.402	0	23	45.2	50.81	9.997 0494	5075.4	3.37	8.86	22 42.6
	16	12	18	35.57	+11.227	+ 0	1	38.2	- 59.61	0.008 9735	+4858.8	3.27	8.62	22 43.3
	17	12	23	13.84	11.945	- 0	23	48.2	67.42	0.020 3618	4629.8	3.19	8.40	22 44.3
	18	12	28	8.11	12.562	0	52	10.5	74.27	0.031 1907	4393.6	3.11	8.19	22 45.5
	19	12	33	16.07	13.087	1	23	5.9	80.20	0.041 4490	4154.9	3.04	8.00	22 46.8
	20	12	38	35.63	13.531	1	56	13.2	85.27	0.051 1354	3917.6	2.97	7.82	22 48.4
	21	12	44	4.97	+13.902	- 2	31	12.4	- 89.53	0.060 2567	+3684.1	2.91	7.66	22 50.1
	22	12	49	42.45	14.211	3	7	44.9	93.06	0.068 8253	3157.3	2.85	7.51	22 51.9
	23	12	55	26.68	14.466	3	45	34.1	95.93	0.076 8581	3238.1	2.80	7.37	22 53.7
	24	13	1	16.46	14.675	4	24	24.8	98.20	0.084 3755	3027.9	2.76	7.25	22 55.7
	25	13	7	10.78	14.845	5	4	3.4	99.93	0.091 3996	2827.1	2.71	7.13	22 57.7
	26	13	13	8.78	+14.984	- 5	44	17.8	-101.19	0.097 9531	+2635.8	2.67	7.02	22 59.8
	27	13	19	9.79	15.096	6	24	57.1	102.02	0.104 0591	2454.2	2.63	6.92	23 1.9
	28	13	25	13.21	15.187	7	5	51.8	102.48	0.109 7411	2282.2	2.59	6.83	23 4.0
	29	13	31	18.61	15.260	7	46	53.4	102.60	0.115 0213	2119.5	2.56	6.75	23 6.2
	30	13	37	25.60	15.320	8	27	54.4	102.44	0.119 9216	1965.5	2.53	6.68	23 8.4
	Nov.	31	13	43	33.91	+15.370	- 9	8	48.3	-102.01	0.124 4623	+1819.7	2.50	6.61	23 10.6
1		13	49	43.32	15.413	9	49	29.2	101.36	0.128 6625	1681.7	2.48	6.54	23 12.9
2		13	55	53.68	15.449	10	29	52.1	100.51	0.132 5404	1551.1	2.46	6.48	23 15.1
3		14	2	4.86	15.482	11	9	52.3	99.48	0.136 1132	1427.2	2.44	6.43	23 17.4
4		14	8	16.81	15.513	11	49	25.8	98.29	0.139 3960	1309.5	2.42	6.38	23 19.7
5		14	14	29.47	+15.542	-12	28	29.1	- 96.96	0.142 4036	+1197.6	2.41	6.34	23 21.9
6		14	20	42.84	15.572	13	6	58.8	95.50	0.145 1485	1090.7	2.39	6.30	23 24.2
7		14	26	56.92	15.601	13	44	52.1	93.92	0.147 6429	988.8	2.37	6.26	23 26.6
8		14	33	11.72	15.633	14	22	6.2	92.24	0.149 8984	891.4	2.36	6.23	23 28.9
9		14	39	27.32	15.666	14	58	38.9	90.47	0.151 9246	797.6	2.35	6.20	23 31.2
10		14	45	43.72	+15.701	-15	34	27.9	- 88.60	0.153 7297	+ 707.5	2.34	6.17	23 33.6
11		14	52	0.98	15.738	16	9	31.1	86.66	0.155 3231	620.8	2.34	6.15	23 35.9
12		14	58	19.18	15.778	16	43	46.8	84.64	0.156 7118	536.9	2.33	6.13	23 38.3
13		15	4	38.36	15.821	17	17	13.0	82.54	0.157 9020	455.5	2.33	6.12	23 40.7
14		15	10	58.60	15.866	17	49	48.1	80.38	0.158 8998	376.3	2.32	6.10	23 43.1
15		15	17	19.97	+15.915	-18	21	30.5	- 78.15	0.159 7100	+ 299.1	2.32	6.09	23 45.5
16	15	23	42.52	+15.965	-18	52	18.7	- 75.86	0.160 3371	+ 223.7	2.31	6.08	23 48.0	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Nov. 16	15 23 42.52	+15.965	-18 52 18.7	-75.86	0.160 3371	+ 223.7	2.31	6.08	23 48.0
17	15 30 6.31	16.018	19 22 11.1	73.50	0.160 7848	149.6	2.31	6.08	23 50.5
18	15 36 31.42	16.074	19 51 6.3	71.09	0.161 0562	76.7	2.31	6.07	23 53.0
19	15 42 57.89	16.132	20 19 2.9	68.61	0.161 1536	+ 4.8	2.31	6.07	23 55.5
20	15 49 25.76	16.191	20 45 59.4	66.08	0.161 0795	- 66.6	2.31	6.07	23 58.1
21	15 55 55.08	+16.252	-21 11 54.6	-63.50	0.160 8342	- 137.7	2.31	6.08	...
22	16 2 25.88	16.315	21 36 47.0	60.86	0.160 4190	208.3	2.31	6.08	0 0.7
23	16 8 58.21	16.378	22 0 35.2	58.15	0.159 8342	279.0	2.32	6.09	0 3.3
24	16 15 32.03	16.441	22 23 17.8	55.39	0.159 0797	350.0	2.32	6.10	0 5.9
25	16 22 7.39	16.505	22 44 53.4	52.57	0.158 1540	421.4	2.32	6.11	0 8.5
26	16 28 44.28	+16.568	-23 5 20.7	-49.69	0.157 0563	- 493.6	2.33	6.13	0 11.2
27	16 35 22.66	16.630	23 24 38.2	46.76	0.155 7841	566.7	2.33	6.15	0 13.9
28	16 42 2.52	16.691	23 42 44.5	43.76	0.154 3353	640.9	2.34	6.18	0 16.6
29	16 48 43.80	16.749	23 59 38.2	40.71	0.152 7069	716.4	2.35	6.20	0 19.4
30	16 55 26.44	16.804	24 15 18.1	37.60	0.150 8953	793.6	2.36	6.22	0 22.2
Dec. 1	17 2 10.36	+16.855	-24 29 42.6	-34.43	0.148 8959	- 872.8	2.37	6.25	0 25.0
2	17 8 55.45	16.902	24 42 50.3	31.20	0.146 7043	951.0	2.38	6.28	0 27.8
3	17 15 41.60	16.943	24 54 39.7	27.91	0.144 3145	1037.8	2.39	6.31	0 30.6
4	17 22 28.67	16.978	25 5 9.7	24.58	0.141 7208	1124.2	2.41	6.35	0 33.4
5	17 29 16.47	17.005	25 14 18.8	21.18	0.138 9160	1213.6	2.43	6.39	0 36.3
6	17 36 4.83	+17.023	-25 22 5.7	-17.72	0.135 8929	-1306.3	2.45	6.44	0 39.2
7	17 42 53.50	17.031	25 28 29.0	14.22	0.132 6429	1402.7	2.47	6.49	0 42.0
8	17 49 42.23	17.028	25 33 27.8	10.67	0.129 1567	1503.0	2.49	6.54	0 44.9
9	17 56 30.73	17.011	25 37 0.6	7.07	0.125 4248	1607.6	2.50	6.59	0 47.8
10	18 3 18.65	16.980	25 39 6.7	- 3.43	0.121 4364	1716.9	2.52	6.65	0 50.7
11	18 10 5.62	+16.931	-25 39 44.9	+ 0.25	0.117 1796	-1831.3	2.54	6.72	0 53.5
12	18 16 51.21	16.864	25 38 54.6	3.95	0.112 6419	1951.0	2.57	6.79	0 56.3
13	18 23 34.94	16.776	25 36 35.1	7.68	0.107 8101	2076.5	2.60	6.87	0 59.1
14	18 30 16.25	16.663	25 32 46.1	11.41	0.102 6696	2208.3	2.64	6.95	1 1.9
15	18 36 54.53	16.523	25 27 27.2	15.15	0.097 2050	2346.8	2.67	7.04	1 4.6
16	18 43 29.09	+16.352	-25 20 39.0	+18.87	0.091 3993	-2492.3	2.71	7.13	1 7.2
17	18 49 59.14	16.146	25 12 21.7	22.57	0.085 2361	2644.9	2.75	7.23	1 9.7
18	18 56 23.79	15.901	25 2 36.1	26.22	0.078 6974	2805.4	2.79	7.34	1 12.2
19	19 2 42.04	15.612	24 51 23.9	29.79	0.071 7640	2973.6	2.83	7.46	1 14.6
20	19 8 52.75	15.272	24 38 46.9	33.27	0.064 4177	3149.6	2.88	7.59	1 16.8
21	19 14 54.64	+14.876	-24 24 48.0	+36.62	0.056 6393	-3333.6	2.93	7.73	1 18.9
22	19 20 46.26	14.415	24 9 30.5	39.81	0.048 4104	3521.9	2.99	7.87	1 20.8
23	19 26 25.97	13.882	23 52 58.9	42.79	0.039 7142	3723.0	3.05	8.03	1 22.5
24	19 31 51.93	13.267	23 35 18.6	45.52	0.030 5356	3926.7	3.11	8.20	1 24.0
25	19 37 2.07	12.562	23 16 36.1	47.96	0.020 8628	4134.4	3.18	8.39	1 25.2
26	19 41 54.08	+11.755	-22 56 59.6	+50.02	0.010 6891	-4343.8	3.26	8.59	1 26.1
27	19 46 25.40	10.835	22 36 38.3	51.67	0.000 0138	4551.6	3.34	8.80	1 26.7
28	19 50 33.20	9.793	22 15 43.3	52.83	9.988 8459	4753.6	3.43	9.03	1 26.8
29	19 54 14.42	8.618	21 54 27.0	53.43	9.977 2054	4944.5	3.52	9.27	1 26.5
30	19 57 25.76	7.303	21 33 3.8	53.40	9.965 1271	5117.1	3.62	9.54	1 25.7
31	20 0 3.77	+ 5.840	-21 11 49.3	+52.69	9.952 6647	-5203.0	3.72	9.81	1 24.4
32	20 2 4.90	....	-20 51 0.5	....	9.939 8932	....	3.83	10.11	1 22.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	1	334 42 29.2	4 2 8.0	- 7 17.0	-6 41 23.3	+ 8 43.3	9.587 5088	-63872
	2	338 48 10.3	4 9 18.0	8 43.0	6 31 31.7	11 1.4	9.581 0322	65620
	3	343 1 12.4	4 16 49.9	10 0.5	6 19 17.7	13 28.0	9.574 3937	67102
	4	347 21 57.2	4 24 43.2	11 6.9	6 4 32.8	16 3.1	9.567 6224	68267
	5	351 50 45.4	4 32 56.4	11 59.4	5 47 9.0	18 45.8	9.560 7528	69058
	6	356 27 56.1	4 41 27.8	-12 35.1	-5 26 59.1	+21 35.1	9.553 8255	-69410
	7	1 13 46.2	4 50 14.6	12 51.6	5 3 57.2	24 29.4	9.546 8879	69252
	8	6 8 29.3	4 59 13.2	12 46.2	4 37 59.3	27 26.6	9.539 9944	68514
	9	11 12 15.1	5 8 19.3	12 17.1	4 9 3.9	30 23.9	9.533 2068	67122
	10	16 25 8.6	5 17 27.4	11 23.1	3 37 12.7	33 17.6	9.526 5942	65004
	11	21 47 8.3	5 26 30.6	-10 3.9	-3 2 31.3	+36 3.6	9.520 2322	-62099
	12	27 18 5.7	5 35 21.4	8 20.3	2 25 9.8	38 36.8	9.514 2023	58356
	13	32 57 43.9	5 43 50.8	6 14.6	1 45 23.7	40 51.8	9.508 5901	53740
	14	38 45 36.9	5 51 49.1	3 50.7	1 3 34.2	42 42.7	9.503 4837	48243
	15	44 41 8.2	5 59 5.8	- 1 13.9	-0 20 8.3	44 3.6	9.498 9700	41892
	16	50 43 31.1	6 5 30.4	+ 1 29.3	+0 24 21.3	+44 49.3	9.495 1319	-34742
	17	56 51 48.0	6 10 52.2	4 10.9	1 9 17.1	44 55.4	9.492 0451	26887
	18	63 4 51.4	6 15 1.8	6 42.8	1 53 57.8	44 18.6	9.489 7735	18463
	19	69 21 24.8	6 17 51.0	8 56.8	2 37 39.7	42 57.8	9.488 3661	9632
	20	75 40 4.3	6 19 13.2	10 45.4	3 19 39.1	40 53.8	9.487 8544	- 585
	21	81 59 21.2	6 19 5.4	+12 2.7	+3 59 14.0	+38 9.6	9.488 2495	+ 8472
	22	88 17 44.6	6 17 26.4	12 44.8	4 35 46.5	34 50.0	9.489 5426	17342
	23	94 33 41.4	6 14 18.8	12 50.0	5 8 44.3	31 1.4	9.491 7051	25828
	24	100 45 54.1	6 9 47.3	12 19.0	5 37 42.2	28 51.5	9.494 6899	33764
	25	106 52 53.7	6 3 59.9	11 14.8	6 2 22.8	22 28.1	9.498 4350	41012
	26	112 53 31.8	5 57 6.2	+ 9 41.9	+6 22 36.5	+17 59.1	9.502 8661	+47472
	27	118 46 47.6	5 49 17.0	7 46.4	6 38 21.6	13 31.8	9.507 9010	53080
	28	124 31 51.2	5 40 44.0	5 34.7	6 49 42.8	9 12.2	9.513 4528	57810
	29	130 8 4.7	5 31 38.6	3 13.6	6 56 50.4	5 5.4	9.519 4337	61664
	30	135 35 1.1	5 22 11.6	+ 0 49.3	6 59 59.1	+ 1 15.0	9.525 7575	64674
	31	140 52 24.3	5 12 33.6	- 1 32.5	+6 59 26.6	- 2 16.8	9.532 3421	+66890
Feb.	1	146 0 7.5	5 2 53.0	3 47.1	6 55 32.3	5 28.3	9.539 1111	68372
	2	150 58 12.0	4 53 17.4	5 50.7	6 48 36.8	8 19.4	9.545 9945	69192
	3	155 46 46.0	4 43 53.0	7 40.4	6 39 0.3	10 50.2	9.552 9298	69420
	4	160 26 3.4	4 34 44.8	9 14.4	6 27 2.8	13 1.6	9.559 8612	69128
	5	164 56 22.1	4 25 56.2	-10 31.6	+6 13 3.0	-14 55.0	9.566 7406	+68392
	6	169 18 3.4	4 17 30.3	11 31.6	5 57 18.3	16 31.6	9.573 5267	67272
	7	173 31 30.7	4 9 23.5	12 14.6	5 40 4.8	17 53.0	9.580 1842	65828
	8	177 37 8.8	4 1 52.0	12 41.0	5 21 36.9	19 0.6	9.586 6832	64110
	9	181 35 23.4	3 54 41.6	12 51.9	5 2 7.7	19 56.0	9.592 9989	62171
	10	185 26 40.5	3 47 57.0	-12 48.4	+4 41 48.5	-20 40.7	9.599 1114	+60052
	11	189 11 25.8	3 41 37.9	12 31.5	4 20 49.5	21 15.8	9.605 0044	57784
	12	192 50 4.6	3 35 44.0	12 2.8	3 59 19.6	21 42.8	9.610 6643	55398
	13	196 23 1.8	3 30 14.4	11 23.6	3 37 26.4	22 2.4	9.616 0809	52922
	14	199 50 41.3	3 25 8.4	10 35.2	3 15 16.8	22 15.9	9.621 2462	50374
	15	203 13 26.1	3 20 24.9	- 9 38.9	+2 52 56.4	-22 24.1	9.626 1539	+47774
	16	206 31 38.3	3 16 3.1	- 8 36.1	+2 30 30.3	-22 27.4	9.630 7999	+45140

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Feb.	16	206 31 38.3	3 16 3.1	- 8 36.1	+2 30 30.3	-22 27.4	9.630 7999	+45140
	17	209 45 39.2	3 12 2.1	7 27.9	2 8 2.9	22 26.8	9.635 1809	42476
	18	212 55 49.1	3 8 20.8	6 15.4	1 45 37.8	22 22.8	9.639 2946	39799
	19	216 2 27.2	3 4 58.5	4 59.8	1 23 18.3	22 15.8	9.643 1404	37114
	20	219 5 52.1	3 1 54.2	3 42.0	1 1 7.1	22 6.2	9.646 7172	34424
	21	222 6 21.4	2 59 7.2	- 2 23.0	+0 39 6.7	-21 54.3	9.650 0254	+31739
	22	225 4 12.0	2 56 36.7	- 1 3.5	+0 17 19.1	21 40.6	9.653 0652	29058
	23	227 59 40.1	2 54 22.0	+ 0 15.5	-0 4 13.9	21 25.1	9.655 8373	26385
	24	230 53 1.2	2 52 22.6	1 33.5	0 25 30.6	21 8.2	9.658 3425	23722
	25	233 44 30.2	2 50 37.8	2 49.6	0 46 29.7	20 49.8	9.660 5819	21068
	26	236 34 21.5	2 49 7.1	+ 4 3.4	-1 7 9.7	-20 30.2	9.662 5563	+18122
	27	239 22 49.0	2 47 50.2	5 14.2	1 27 29.6	20 9.4	9.664 2668	15790
	28	242 10 6.3	2 46 46.6	6 21.5	1 47 28.2	19 47.6	9.665 7145	13164
Mar.	1	244 56 26.5	2 45 56.0	7 24.8	2 7 4.4	19 24.6	9.666 8999	10516
	2	247 42 2.6	2 45 18.2	8 23.6	2 26 17.2	19 0.8	9.667 8240	7936
	3	250 27 7.0	2 44 52.7	+ 9 17.6	-2 45 5.6	-18 35.8	9.668 4872	+ 5330
	4	253 11 52.2	2 44 39.8	10 6.3	3 3 28.5	18 9.8	9.668 8902	2729
	5	255 56 30.6	2 44 39.0	10 49.4	3 21 24.8	17 42.6	9.669 0330	+ 128
	6	258 41 14.4	2 44 50.6	11 26.5	3 38 53.3	17 14.2	9.668 9159	- 2170
	7	261 26 15.8	2 45 14.2	11 57.3	3 55 52.9	16 44.8	9.668 5389	5072
	8	264 11 47.0	2 45 50.2	+12 21.5	-4 12 22.3	-16 13.8	9.667 9013	- 7678
	9	266 58 0.2	2 46 38.4	12 38.9	4 28 20.0	15 41.4	9.667 0031	10288
	10	269 45 8.0	2 47 39.2	12 49.3	4 43 44.5	15 7.3	9.665 8436	12904
	11	272 33 22.9	2 48 52.8	12 52.3	4 58 34.0	14 31.4	9.664 4220	15530
	12	275 22 57.8	2 50 19.2	12 47.9	5 12 46.7	13 53.6	9.662 7373	18163
	13	278 14 5.7	2 51 58.8	+12 35.9	-5 26 20.6	-13 13.6	9.660 7891	-20804
	14	281 7 0.0	2 53 52.1	12 16.2	5 39 13.4	12 31.4	9.658 5761	23458
	15	284 1 54.6	2 55 59.4	11 48.7	5 51 22.5	11 46.4	9.656 0972	26122
	16	286 59 3.7	2 58 21.2	11 13.4	6 2 45.2	10 58.6	9.653 3514	28793
	17	289 58 42.0	3 0 57.8	10 30.4	6 13 18.5	10 7.5	9.650 3383	31473
	18	293 1 4.6	3 3 50.0	+ 9 39.7	-6 22 59.0	- 9 12.9	9.647 0566	-34160
	19	296 6 27.4	3 6 58.3	8 41.6	6 31 43.0	8 14.4	9.643 5063	36849
	20	299 15 6.8	3 10 23.3	7 36.3	6 39 26.4	7 11.7	9.639 6869	39536
	21	302 27 19.8	3 14 5.6	6 24.1	6 46 4.8	6 4.3	9.635 5995	42213
	22	305 43 24.1	3 18 6.0	5 5.6	6 51 33.3	4 51.8	9.631 2447	44879
	23	309 3 38.2	3 22 25.3	+ 3 41.4	-6 55 46.6	- 3 33.8	9.626 6246	-47518
	24	312 28 21.2	3 27 4.0	2 12.3	6 58 38.9	2 9.8	9.621 7423	50121
	25	315 57 52.9	3 32 2.8	+ 0 39.1	7 0 3.9	- 0 39.1	9.616 6021	52674
	26	319 32 33.9	3 37 22.7	- 0 56.9	6 59 54.8	+ 0 58.4	9.611 2098	55158
	27	323 12 45.4	3 43 3.9	2 34.5	6 58 4.5	2 43.4	9.605 5734	57555
Apr.	28	326 58 49.0	3 49 7.0	- 4 12.0	-6 54 25.3	+ 4 36.4	9.599 7026	-59838
	29	330 51 6.9	3 55 32.6	5 47.8	6 48 49.0	6 37.6	9.593 6106	61975
	30	334 50 1.8	4 2 20.8	7 19.7	6 41 7.3	8 47.2	9.587 3136	63933
	31	338 55 56.0	4 9 31.3	8 45.5	6 31 11.6	11 5.7	9.580 8313	65673
	1	343 9 11.8	4 17 4.0	10 2.7	6 18 53.1	13 32.7	9.574 1879	67146
	2	347 30 11.1	4 24 58.0	-11 8.7	-6 4 3.5	+16 8.0	9.567 4127	-68302
	3	351 59 14.5	4 33 12.0	-12 0.7	-5 46 34.7	+18 50.8	9.560 5402	-69080

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Apr.	1	343 9 11.8	4 17 4.0	-10 2.7	-6 18 53.1	+13 32.7	9.574 1879	-67146
	2	347 30 11.1	4 24 58.0	11 8.7	6 4 3.5	16 8.0	9.567 4127	68302
	3	351 59 14.5	4 33 12.0	12 0.7	5 46 34.7	18 50.8	9.560 5402	69080
	4	356 36 41.0	4 41 43.8	12 35.9	5 26 19.6	21 40.4	9.553 6113	69418
	5	1 22 47.3	4 50 31.0	12 51.7	5 3 12.3	24 34.8	9.546 6737	69245
	6	6 17 47.0	4 59 30.0	-12 45.7	-4 37 9.0	+27 32.0	9.539 7818	-68488
	7	11 21 49.8	5 8 36.4	12 15.9	4 8 8.2	30 29.2	9.532 9980	67073
	8	16 35 0.3	5 17 44.4	11 21.1	3 36 11.7	33 22.9	9.526 3914	64932
	9	21 57 16.9	5 26 47.4	10 1.1	3 1 25.1	36 8.5	9.520 0378	62004
	10	27 28 30.9	5 35 37.8	8 16.8	2 23 58.9	38 41.4	9.514 0186	58235
	11	33 8 25.2	5 44 6.6	- 6 10.5	-1 44 8.6	+40 55.6	9.508 4200	-53592
	12	38 56 33.3	5 52 3.7	3 46.1	1 2 15.7	42 45.6	9.503 3297	48068
	13	44 52 18.6	5 59 19.0	- 1 8.9	-0 18 47.3	44 5.7	9.498 8349	41688
	14	50 54 53.8	6 5 41.8	+ 1 34.3	+0 25 43.8	44 50.2	9.495 0186	34512
	15	57 3 21.2	6 11 1.7	4 15.8	1 10 39.8	44 55.0	9.491 9556	26640
	16	63 16 33.0	6 15 9.0	+ 6 47.2	+1 55 19.4	+44 16.9	9.489 7095	-18200
	17	69 33 12.2	6 17 55.5	9 0.5	2 38 58.9	42 54.7	9.488 3291	9358
	18	75 51 55.0	6 19 15.2	10 48.2	3 20 54.5	40 49.5	9.487 8448	- 309
	19	82 11 12.4	6 19 4.4	12 4.5	4 0 24.5	38 4.1	9.488 2676	+ 8750
	20	88 29 33.5	6 17 22.7	12 45.5	4 36 50.9	34 43.4	9.489 5883	17612
	21	94 45 28.2	6 14 12.3	+12 49.6	+5 9 41.7	+30 54.0	9.491 7770	+26084
	22	100 57 30.2	6 9 38.4	12 17.5	5 38 31.9	26 43.6	9.494 7866	34002
	23	107 4 19.8	6 3 48.8	11 12.3	6 3 4.4	22 19.9	9.498 5542	41226
	24	113 4 45.8	5 56 53.1	9 38.7	6 23 9.9	17 50.8	9.503 0055	47662
	25	118 57 47.7	5 49 2.4	7 42.5	6 38 46.7	13 23.6	9.508 0581	53244
	26	124 42 36.1	5 40 28.1	+ 5 30.5	+6 49 59.8	+ 9 4.4	9.513 6249	+57947
	27	130 18 33.2	5 31 21.8	3 9.1	6 56 59.8	4 58.0	9.519 6183	61776
	28	135 45 12.6	5 21 54.4	+ 0 44.8	7 0 1.3	+ 1 8.0	9.525 9519	64761
	29	141 2 18.3	5 12 16.0	- 1 36.9	6 59 22.2	- 2 23.0	9.532 5440	66953
	30	146 9 43.8	5 2 35.4	3 51.2	6 55 22.0	5 33.9	9.539 3180	68412
May	1	151 7 30.8	4 53 0.0	- 5 54.3	+6 48 21.2	- 8 24.4	9.546 2044	+69212
	2	155 55 47.6	4 43 36.0	7 43.6	6 38 40.0	10 54.6	9.553 1407	69423
	3	160 34 48.2	4 34 28.2	9 17.1	6 26 38.4	13 5.5	9.560 0718	69118
	4	165 4 50.7	4 25 40.4	10 33.8	6 12 35.0	14 58.4	9.566 9494	68367
	5	169 26 16.5	4 17 15.0	11 33.2	5 56 47.3	16 34.4	9.573 7325	67237
	6	173 39 28.9	4 9 14.0	-12 15.6	+5 39 31.2	-17 55.4	9.580 3860	+65782
	7	177 44 53.0	4 1 38.4	12 41.6	5 21 1.2	19 2.5	9.586 8800	64058
	8	181 42 54.3	3 54 28.6	12 52.0	5 1 30.2	19 57.6	9.593 1902	62114
	9	185 33 58.9	3 47 44.8	12 48.0	4 41 9.6	20 42.0	9.599 2966	59986
	10	189 18 32.4	3 41 26.5	12 30.8	4 20 9.5	21 16.8	9.605 1825	57714
	11	192 57 0.3	3 35 33.4	-12 1.8	+3 58 38.7	-21 43.4	9.610 8354	+55326
	12	196 29 47.3	3 30 4.6	11 22.2	3 36 45.0	22 3.0	9.616 2446	52845
	13	199 57 17.2	3 24 59.2	10 33.5	3 14 34.9	22 16.2	9.621 4021	50296
	14	203 19 53.2	3 20 16.4	9 37.0	2 52 14.3	22 24.2	9.626 3020	47696
	15	206 37 57.2	3 15 55.2	8 34.0	2 29 48.1	22 27.4	9.630 9401	45060
	16	209 51 50.6	3 11 54.9	- 7 25.7	+2 7 20.7	-22 26.8	9.635 3130	+42396
	17	213 1 53.6	3 8 14.2	- 6 13.1	+1 44 55.7	-22 22.6	9.639 4188	+39716

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
May	17	213 1 53.6	3 8 14.2	- 6 13.1	+1 44 55.7	-22 22.6	9.639 4188	+39716
	18	216 8 25.4	3 4 52.4	4 57.4	1 22 36.4	22 15.4	9.643 2561	37032
	19	219 11 44.5	3 1 48.6	3 39.6	1 0 25.6	22 5.8	9.646 8250	34343
	20	222 12 8.5	2 59 2.2	2 20.5	0 38 25.5	21 54.0	9.650 1247	31655
	21	225 9 54.4	2 56 32.2	- 1 1.0	+0 16 38.3	21 40.2	9.653 1562	28976
	22	228 5 18.2	2 54 18.0	+ 0 18.0	-0 4 54.2	-21 24.6	9.655 9200	+26303
	23	230 58 35.5	2 52 19.0	1 35.9	0 26 10.4	21 7.5	9.658 4171	23638
	24	233 50 1.2	2 50 34.7	2 52.0	0 47 8.8	20 49.2	9.660 6481	20985
	25	236 39 49.6	2 49 4.4	4 5.7	1 7 48.3	20 29.5	9.662 6145	18343
	26	239 28 14.7	2 47 48.0	5 16.4	1 28 7.5	20 8.7	9.664 3170	15708
	27	242 15 29.9	2 46 44.7	+ 6 23.6	-1 48 5.4	-19 46.9	9.665 7565	+13084
	28	245 1 48.5	2 45 54.6	7 26.7	2 7 40.9	19 23.9	9.666 9340	10466
	29	247 47 23.3	2 45 17.0	8 25.4	2 26 52.9	19 0.0	9.667 8500	7856
	30	250 32 26.8	2 44 52.1	9 19.2	2 45 40.5	18 35.0	9.668 5053	5250
	31	253 17 11.6	2 44 39.5	10 7.8	3 4 2.6	18 9.0	9.668 9001	2618
June	1	256 1 49.9	2 44 39.2	+10 50.6	-3 21 58.0	-17 41.8	9.669 0349	+ 48
	2	258 46 34.0	2 44 51.0	11 27.5	3 39 25.7	17 13.4	9.668 9097	- 2552
	3	261 31 36.0	2 45 15.0	11 58.1	3 56 24.4	16 43.7	9.668 5245	5154
	4	264 17 8.2	2 45 51.1	12 22.2	4 12 52.7	16 12.8	9.667 8789	7758
	5	267 3 22.9	2 46 40.0	12 39.4	4 28 49.4	15 40.4	9.666 9726	10369
	6	269 50 32.5	2 47 41.2	+12 49.5	-4 44 12.8	-15 6.2	9.665 8049	-12985
	7	272 38 49.6	2 48 55.2	12 52.3	4 59 1.2	14 30.4	9.664 3753	15610
	8	275 28 27.1	2 50 22.0	12 47.7	5 13 12.8	13 52.4	9.662 6826	18244
	9	278 19 37.9	2 52 2.0	12 35.4	5 26 45.4	13 12.4	9.660 7261	20888
	10	281 12 35.7	2 53 55.8	12 15.5	5 39 36.8	12 30.0	9.658 5048	23540
	11	284 7 34.1	2 56 3.4	+11 47.7	-5 51 44.5	-11 45.0	9.656 0177	-26204
	12	287 4 47.5	2 58 25.7	11 12.2	6 3 5.7	10 57.0	9.653 2637	28877
	13	290 4 30.5	3 1 2.8	10 29.0	6 13 37.4	10 5.8	9.650 2421	31556
	14	293 6 58.4	3 3 55.6	9 38.0	6 23 16.2	9 11.2	9.646 9523	34242
	15	296 12 27.0	3 7 4.3	8 39.7	6 31 58.4	8 12.5	9.643 3936	36932
	16	299 21 12.6	3 10 29.8	+ 7 34.1	-6 39 39.8	- 7 9.6	9.639 5661	-39619
	17	302 33 32.4	3 14 12.8	6 21.8	6 46 16.1	6 2.2	9.635 4701	42298
	18	305 49 44.1	3 18 13.8	5 3.1	6 51 42.4	4 49.4	9.631 1070	44960
	19	309 10 6.2	3 22 33.6	3 38.7	6 55 53.2	3 31.2	9.626 4788	47599
	20	312 34 57.7	3 27 12.8	2 9.4	6 58 42.9	2 7.0	9.621 5884	50203
July	21	316 4 38.6	3 32 12.3	+ 0 36.2	-7 0 5.1	- 0 36.2	9.616 4400	-52754
	22	319 39 29.3	3 37 32.7	- 0 59.9	6 59 53.0	+ 1 1.6	9.611 0400	55236
	23	323 19 51.2	3 43 14.7	2 37.5	6 57 59.4	2 46.9	9.605 3959	57629
	24	327 6 6.0	3 49 18.6	4 15.1	6 54 16.6	4 40.0	9.599 5181	59906
	25	330 58 35.8	3 55 44.8	5 50.7	6 48 36.6	6 41.4	9.593 4195	62038
	26	334 57 43.2	4 2 33.6	- 7 22.5	-6 40 50.9	+ 8 51.4	9.587 1164	-63992
	27	339 3 50.6	4 9 45.0	8 48.0	6 30 50.9	11 10.0	9.580 6286	65725
	28	343 17 20.5	4 17 18.4	10 5.0	6 18 27.9	13 37.4	9.573 9804	67189
	29	347 38 34.4	4 25 12.9	11 10.5	6 3 33.4	16 12.9	9.567 2015	68333
	30	352 7 53.0	4 33 27.5	12 2.1	5 45 59.6	18 58.0	9.560 3264	69100
	1	356 45 35.3	4 41 59.9	-12 36.7	-5 25 39.2	+21 45.7	9.553 3964	-69422
	2	1 31 57.9	4 50 47.6	-12 51.9	-5 2 26.6	+24 40.2	9.546 4590	-69234

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
July	1	356 45 35.3	4 41 59.9	-12 36.7	-5 25 39.2	+21 45.7	9.553 3964	-69422
	2	1 31 57.9	4 50 47.6	12 51.9	5 2 26.6	24 40.2	9.546 4590	69231
	3	6 27 14.3	4 59 46.8	12 45.1	4 36 17.8	27 37.6	9.539 5693	68457
	4	11 31 34.0	5 8 53.4	12 14.5	4 7 11.5	30 34.8	9.532 7896	67022
	5	16 45 1.5	5 18 1.4	11 19.0	3 35 9.6	33 28.2	9.526 1893	64858
	6	22 7 35.0	5 27 4.2	-9 58.2	-3 0 17.9	+36 13.6	9.519 8445	-61904
	7	27 39 5.5	5 35 54.0	8 13.2	2 22 46.9	38 45.8	9.513 8367	58106
	8	33 19 15.7	5 44 21.9	6 6.3	1 42 52.5	40 59.4	9.508 2524	53135
	9	39 7 38.7	5 52 18.0	3 41.4	1 0 56.2	42 48.6	9.503 1790	47886
	10	45 3 37.6	5 59 31.9	-1 3.9	-0 17 25.3	44 7.6	9.498 7037	11480
	11	51 6 24.9	6 5 53.0	+1 39.4	+0 27 7.2	+44 51.0	9.494 9093	-34282
	12	57 15 2.5	6 11 10.8	4 20.6	1 12 3.5	44 54.5	9.491 8705	26388
	13	63 28 22.1	6 15 15.6	6 51.7	1 56 41.9	44 15.0	9.489 6505	17932
	14	69 45 6.8	6 17 59.6	9 4.3	2 40 18.8	42 51.5	9.488 2973	9081
	15	76 3 52.3	6 19 16.5	10 51.1	3 22 10.6	40 45.0	9.487 8411	-26
	16	82 23 9.6	6 19 3.0	+12 6.3	+4 1 35.4	+37 58.4	9.488 2921	+9027
	17	88 41 27.8	6 17 18.4	12 46.2	4 37 55.6	34 38.7	9.489 6398	17878
	18	94 57 16.9	6 14 5.4	12 49.1	5 10 39.3	30 40.5	9.491 8548	26340
	19	101 9 10.7	6 9 29.0	12 16.0	5 39 21.7	26 35.5	9.494 8890	34238
	20	107 15 49.7	6 3 37.2	11 9.8	6 3 46.0	22 11.6	9.498 6792	41441
	21	113 16 3.1	5 56 39.6	+9 35.4	+6 23 43.1	+17 42.4	9.503 1507	+47850
	22	119 8 50.6	5 48 47.2	7 38.6	6 39 11.6	13 15.4	9.508 2206	53104
	23	124 53 23.2	5 40 11.8	5 26.2	6 50 16.7	8 56.6	9.513 8021	58061
	24	130 29 3.5	5 31 4.6	3 4.6	6 57 9.0	4 50.6	9.519 8076	61883
	25	135 55 25.5	5 21 36.7	+0 40.3	7 0 3.4	+1 1.2	9.526 1506	64842
	26	141 12 13.4	5 11 58.1	-1 41.2	+6 59 17.7	-2 29.4	9.532 7496	+67010
	27	146 19 21.1	5 2 17.6	3 55.2	6 55 11.5	5 39.6	9.539 5283	68448
	28	151 16 50.3	4 52 42.4	5 57.9	6 48 5.3	8 29.4	9.546 4174	69230
	29	156 4 49.7	4 43 18.8	7 46.7	6 38 19.5	10 59.0	9.553 3547	69424
	30	160 43 33.4	4 34 11.6	9 19.7	6 26 13.7	13 9.4	9.560 2851	69103
Aug.	31	165 13 19.6	4 25 24.4	-10 35.9	+6 12 6.8	-15 1.6	9.567 1605	+68338
	1	169 34 29.7	4 16 59.8	11 34.8	5 56 16.1	16 37.2	9.573 9402	67197
	2	173 47 27.3	4 8 59.6	12 16.7	5 38 57.5	17 57.6	9.580 5892	65734
	3	177 52 37.2	4 1 24.6	12 42.2	5 20 25.4	19 4.4	9.587 0781	64002
	4	181 50 25.2	3 54 15.8	12 52.1	5 0 52.7	19 59.2	9.593 3823	62050
	5	185 41 17.3	3 47 32.7	-12 47.8	+4 40 30.7	-20 43.2	9.599 4822	+59919
	6	189 25 39.1	3 41 15.2	12 30.1	4 19 29.5	21 17.8	9.605 3612	57642
	7	193 3 56.0	3 35 22.8	12 0.7	3 57 57.9	21 44.2	9.611 0067	55250
	8	196 36 32.7	3 29 54.6	11 20.8	3 36 3.5	22 3.5	9.616 4083	52769
	9	200 3 53.1	3 24 50.0	10 31.9	3 13 53.0	22 16.6	9.621 5582	50218
	10	203 26 20.3	3 20 8.0	-9 35.2	+2 51 32.1	-22 21.4	9.626 4502	+47615
	11	206 44 16.2	3 15 47.4	8 31.9	2 29 5.8	22 27.5	9.631 0800	44976
	12	209 58 2.1	3 11 47.7	7 23.4	2 6 38.4	22 26.6	9.635 4446	42314
	13	213 7 58.2	3 8 7.6	6 10.8	1 44 13.6	22 22.4	9.639 5422	39635
	14	216 14 23.7	3 4 46.4	4 55.0	1 21 54.5	22 15.2	9.643 3713	36948
	15	219 17 37.0	3 1 43.2	-3 37.1	+0 59 44.0	-22 5.4	9.646 9318	+34260
	16	222 17 55.9	2 58 57.2	-2 18.0	+0 37 44.3	-21 53.6	9.650 2233	+31572

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Aug.	16	222 17 55.9	2 58 57.2	- 2 18.0	+0 37 44.3	-21 53.6	9.650 2233	+31572
	17	225 15 37.0	2 56 27.8	- 0 58.6	+0 15 57.5	21 39.7	9.653 2465	28893
	18	228 10 56.7	2 54 14.1	+ 0 20.5	-0 5 34.5	21 24.1	9.656 0021	26220
	19	231 4 10.2	2 52 15.5	1 38.3	0 26 50.2	21 7.0	9.658 4909	23557
	20	233 55 32.6	2 50 31.6	2 54.4	0 47 48.1	20 48.6	9.660 7138	20903
	21	236 45 18.2	2 49 1.8	+ 4 8.0	-1 8 26.9	-20 28.8	9.662 6719	+18260
	22	239 33 40.9	2 47 45.8	5 18.6	1 28 45.4	20 8.0	9.664 3662	15626
	23	242 20 54.2	2 46 43.0	6 25.6	1 48 42.6	19 46.2	9.665 7975	13002
	24	245 7 11.2	2 45 53.1	7 28.6	2 8 17.4	19 23.2	9.666 9668	10384
	25	247 52 44.7	2 45 16.0	8 27.2	2 27 28.7	18 59.2	9.667 8746	7774
	26	250 37 47.5	2 44 51.5	+ 9 20.8	-2 46 15.5	-18 34.2	9.668 5217	+ 5168
	27	253 22 31.8	2 44 39.2	10' 9.2	3 4 36.7	18 8.1	9.668 9084	+ 2566
	28	256 7 10.0	2 44 39.4	10 51.9	3 22 31.3	17 40.9	9.669 0351	- 32
	29	258 51 54.5	2 44 51.6	11 28.6	3 39 58.1	17 12.4	9.668 9020	2632
	30	261 36 57.2	2 45 16.0	11 59.0	3 56 55.8	16 42.8	9.668 5086	5235
Sept.	31	264 22 30.5	2 45 52.7	+12 22.8	-4 13 23.2	-16 11.8	9.667 8549	- 7840
	1	267 8 46.7	2 46 41.8	12 39.8	4 29 18.9	15 39.3	9.666 9405	10150
	2	269 55 58.2	2 47 43.4	12 49.7	4 44 41.2	15 5.1	9.665 7646	13068
	3	272 44 17.6	2 48 57.6	12 52.3	4 59 28.5	14 29.1	9.664 3267	15692
	4	275 33 57.7	2 50 24.8	12 47.4	5 13 38.8	13 51.2	9.662 6259	18326
	5	278 25 11.7	2 52 5.4	+12 34.9	-5 27 10.2	-13 11.2	9.660 6612	-20970
	6	281 18 13.0	2 53 59.6	12 14.7	5 40 0.3	12 28.6	9.658 4316	23624
	7	284 13 15.5	2 56 7.8	11 46.7	5 52 6.6	11 43.5	9.655 9360	26288
	8	287 10 33.3	2 58 30.4	11 11.0	6 3 26.3	10 55.4	9.653 1737	28960
	9	290 10 21.2	3 1 8.0	10 27.5	6 13 56.4	10 4.2	9.650 1437	31640
	10	293 12 54.5	3 4 1.2	+ 9 36.3	-6 23 33.5	- 9 9.4	9.646 8454	-34327
	11	296 18 29.0	3 7 10.4	8 37.7	6 32 13.8	8 10.6	9.643 2782	37016
	12	299 27 21.0	3 10 36.5	7 32.0	6 39 53.3	7 7.6	9.639 4423	39702
	13	302 39 47.8	3 14 20.0	6 19.4	6 46 27.5	5 59.9	9.635 3380	42382
	14	305 56 7.0	3 18 21.5	5 0.5	6 51 51.4	4 47.0	9.630 9666	45044
	15	309 16 37.1	3 22 42.0	+ 3 36.0	-6 55 59.8	- 3 28.7	9.626 3301	-47682
	16	312 41 37.4	3 27 21.8	2 6.6	6 58 46.8	2 4.2	9.621 4315	50284
	17	316 11 27.6	3 32 22.0	+ 0 33.2	7 0 6.1	- 0 33.3	9.616 2752	52832
	18	319 46 28.5	3 37 43.2	- 1 3.0	6 59 51.0	+ 1 4.8	9.610 8675	55312
	19	323 27 1.1	3 43 25.6	2 40.6	6 57 54.1	2 50.3	9.605 2158	57702
	20	327 13 27.2	3 49 30.2	- 4 18.1	-6 54 7.8	+ 4 43.6	9.599 3310	-59975
	21	331 6 9.1	3 55 57.3	5 53.7	6 48 24.0	6 45.4	9.593 2257	62103
	22	335 5 29.3	4 2 46.8	7 25.3	6 40 34.2	8 55.6	9.586 9165	64048
	23	339 11 50.2	4 9 58.8	8 50.6	6 30 29.8	11 14.6	9.580 4234	65774
	24	343 25 34.3	4 17 32.9	10 7.2	6 18 2.2	13 42.0	9.573 7707	67230
	25	347 47 3.0	4 25 28.1	-11 12.4	-6 3 2.9	+16 17.9	9.566 9882	-68363
	26	352 16 37.1	4 33 43.2	12 3.4	5 45 23.9	19 1.2	9.560 1108	69117
	27	356 54 35.3	4 42 16.1	12 37.5	5 24 58.3	21 51.0	9.553 1797	69425
	28	1 41 14.4	4 51 4.3	12 52.0	5 1 40.2	24 45.8	9.546 2430	69216
	29	6 36 47.7	5 0 3.8	12 44.5	4 35 25.8	27 43.2	9.539 3560	68420
Oct.	30	11 41 24.4	5 9 10.4	-12 13.2	-4 6 14.0	+30 40.2	9.532 5811	-66964
	1	16 55 9.0	5 18 18.4	-11 16.8	-3 34 6.6	+33 33.5	9.525 9876	-64778

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Oct.	1	16 55 9.0	5 18 18.4	-11 16.8	-3 34 6.6	+33 33.5	9.525 9876	-04778
	2	22 17 59.5	5 27 21.0	9 55.3	2 59 9.8	36 18.4	9.519 6521	61796
	3	27 49 46.5	5 36 10.1	8 9.5	2 21 34.1	38 50.3	9.513 6564	57972
	4	33 30 12.4	5 44 37.0	6 2.0	1 41 35.5	41 3.2	9.508 0868	53274
	5	39 18 50.2	5 52 32.2	3 36.6	0 59 35.8	42 51.6	9.503 0309	47696
	6	45 15 2.5	5 59 44.6	-0 58.8	-0 16 2.5	+44 9.6	9.498 5759	-41266
	7	51 18 1.6	6 6 3.8	+1 44.5	+0 28 31.4	44 51.8	9.494 8040	34045
	8	57 26 48.9	6 11 19.4	4 25.6	1 13 27.7	44 53.8	9.491 7900	26130
	9	63 40 16.0	6 15 21.9	6 56.1	1 58 4.8	44 13.0	9.489 5965	17659
	10	69 57 5.6	6 18 3.2	9 8.0	2 41 39.1	42 48.2	9.488 2711	-8800
	11	76 15 53.3	6 19 17.3	+10 54.0	+3 23 26.9	+40 40.4	9.487 8430	+256
	12	82 35 10.0	6 19 0.8	12 8.1	4 2 46.5	37 52.5	9.488 3221	9308
	13	88 53 24.7	6 17 13.6	12 46.8	4 39 0.3	34 29.9	9.489 6977	18152
	14	95 9 7.6	6 13 57.9	12 48.6	5 11 36.8	30 39.0	9.491 9390	26595
	15	101 20 52.7	6 9 19.0	12 14.4	5 40 11.4	26 27.4	9.494 9978	34473
	16	107 27 20.5	6 3 24.9	+11 7.2	+6 4 27.4	+22 3.2	9.498 8103	+41651
	17	113 27 20.7	5 56 25.4	9 32.0	6 24 16.1	17 34.0	9.503 3015	48034
	18	119 19 53.3	5 48 31.7	7 34.7	6 39 36.3	13 7.2	9.508 3887	53563
	19	125 4 9.8	5 39 55.0	5 21.8	6 50 33.3	8 48.6	9.513 9847	58212
	20	130 39 32.9	5 30 47.0	3 0.1	6 57 17.9	4 43.2	9.520 0018	61986
	21	136 5 37.1	5 21 18.8	+0 35.8	+7 0 5.2	+0 54.4	9.526 3539	+64920
	22	141 22 6.9	5 11 39.9	-1 45.5	6 59 13.0	-2 35.4	9.532 9595	67066
	23	146 28 56.4	5 1 59.4	3 59.2	6 55 0.9	5 45.2	9.539 7427	68482
	24	151 26 7.7	4 52 24.6	6 1.6	6 47 49.4	8 34.4	9.546 6340	69242
	25	156 13 49.5	4 43 1.4	7 49.9	6 37 58.9	11 3.4	9.553 5716	69420
	26	160 52 16.1	4 33 54.8	-9 22.4	+6 25 49.1	-13 13.1	9.560 5008	+69086
	27	165 21 45.9	4 25 8.3	10 38.0	6 11 38.7	15 4.8	9.567 3739	68308
	28	169 42 40.3	4 16 44.4	11 36.4	5 55 45.0	16 39.9	9.574 1498	67151
	29	173 55 22.9	4 8 45.0	12 17.8	5 38 23.9	17 59.9	9.580 7941	65682
	30	178 0 18.7	4 1 11.0	12 42.7	5 19 49.7	19 6.3	9.587 2774	63945
Nov.	31	181 57 53.4	3 54 2.8	-12 52.2	+5 0 15.3	-20 0.7	9.593 5757	+61986
	1	185 48 32.9	3 47 20.6	12 47.3	4 39 51.9	20 44.4	9.599 6687	59849
	2	189 32 43.0	3 11 3.8	12 29.3	4 18 49.6	21 18.7	9.605 5407	57568
	3	193 10 48.9	3 35 12.2	11 59.6	3 57 17.2	21 44.9	9.611 1786	55174
	4	196 43 15.4	3 29 44.8	11 19.4	3 35 22.2	22 4.0	9.616 5724	52690
	5	200 10 26.4	3 24 41.0	-10 30.2	+3 13 11.3	-22 16.9	9.621 7142	+50137
	6	203 32 44.8	3 19 59.6	9 33.3	2 50 50.2	22 24.5	9.626 5981	47533
	7	206 50 32.7	3 15 39.8	8 29.9	2 28 23.8	22 27.6	9.631 2196	44894
	8	210 4 11.2	3 11 40.6	7 21.2	2 5 56.4	22 26.6	9.635 5760	42231
	9	213 14 0.4	3 8 1.1	6 8.4	1 43 31.7	22 22.2	9.639 6652	39550
	10	216 20 19.7	3 4 40.5	-4 52.6	+1 21 12.9	-22 15.0	9.643 4858	+36864
	11	219 23 27.4	3 1 37.8	3 34.6	0 59 2.6	22 5.2	9.647 0379	34176
	12	222 23 41.1	2 58 52.4	2 15.5	0 37 3.8	21 53.1	9.650 3211	31490
	13	225 21 17.7	2 56 23.4	-0 56.1	+0 15 17.0	21 39.2	9.653 3360	28810
	14	228 16 33.2	2 54 10.2	+0 22.9	-0 6 14.6	21 23.6	9.656 0832	26136
	15	231 9 43.1	2 52 12.0	+1 40.7	-0 27 29.7	-21 6.4	9.658 5636	+23474
	16	234 1 2.2	2 50 28.6	+2 56.7	-0 48 27.0	-20 48.0	9.660 7783	+20822

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Nov.	16	234 1 2.2	2 50 28.6	+ 2 56.7	-0 48 27.0	-20 48.0	9.660 7783	+20822
	17	236 50 45.1	2 18 59.4	4 10.2	1 9 5.2	20 28.2	9.662 7282	18178
	18	239 39 5.5	2 47 13.6	5 20.7	1 29 23.1	20 7.4	9.664 4142	15514
	19	242 26 16.8	2 46 41.2	6 27.6	1 49 19.6	19 45.5	9.665 8374	12921
	20	245 12 32.3	2 45 51.8	7 30.5	2 8 53.7	19 22.6	9.666 9986	10304
	21	247 58 4.7	2 45 15.1	+ 8 28.9	-2 28 4.3	-18 58.5	9.667 8983	+ 7693
	22	250 43 6.7	2 44 51.0	9 22.4	2 46 50.3	18 33.4	9.668 5374	5089
	23	253 27 50.8	2 44 39.2	10 10.6	3 5 10.7	18 7.2	9.668 9162	+ 2186
	24	256 12 29.1	2 44 39.5	10 53.1	3 23 4.4	17 40.0	9.669 0348	- 114
	25	258 57 13.9	2 44 52.2	11 29.6	3 40 30.4	17 11.6	9.668 8935	2713
	26	261 42 17.5	2 45 17.0	+11 59.8	-3 57 27.2	-16 41.8	9.668 4921	- 5316
	27	264 27 52.0	2 45 54.1	12 23.4	4 13 53.6	16 10.8	9.667 8302	7922
	28	267 14 9.8	2 46 43.5	12 40.2	4 29 48.3	15 38.2	9.666 9077	10530
	29	270 1 23.2	2 47 45.1	12 49.9	4 45 9.5	15 4.0	9.665 7239	13148
	30	272 49 44.9	2 49 0.2	12 52.2	4 59 55.6	14 28.0	9.664 2779	15774
Dec.	1	275 39 27.8	2 50 27.8	+12 47.1	-5 14 4.8	-13 50.0	9.662 5689	-18408
	2	278 30 45.0	2 52 8.8	12 34.4	5 27 34.9	13 9.8	9.660 5961	21051
	3	281 23 49.9	2 54 3.3	12 14.0	5 40 23.7	12 27.3	9.658 3584	23704
	4	284 18 56.3	2 56 11.8	11 45.7	5 52 28.6	11 42.0	9.655 8549	26368
	5	287 16 18.5	2 58 35.0	11 9.7	6 3 46.8	10 53.9	9.653 0845	29012
	6	290 16 11.4	3 1 13.2	+10 26.0	-6 14 15.3	-10 2.5	9.650 0462	-31723
	7	293 18 50.0	3 4 6.8	9 34.6	6 23 50.6	9 7.6	9.646 7397	34110
	8	296 24 30.3	3 7 16.6	8 35.8	6 32 29.1	8 8.7	9.643 1642	37098
	9	299 33 28.8	3 10 43.2	7 29.8	6 40 6.6	7 5.6	9.639 3201	39783
	10	302 46 2.5	3 14 27.2	6 17.0	6 46 38.7	5 57.8	9.635 2078	42461
	11	306 2 29.2	3 18 29.3	+ 4 58.0	-6 52 0.4	- 4 44.7	9.630 8284	-45123
	12	309 23 7.4	3 22 50.3	3 33.3	6 56 6.3	3 26.2	9.626 1840	47760
	13	312 48 16.3	3 27 30.8	2 3.7	6 58 50.7	2 1.6	9.621 2776	50360
	14	316 18 15.7	3 32 31.6	+ 0 30.2	7 0 7.2	- 0 30.4	9.616 1139	52906
	15	319 53 26.4	3 37 53.3	- 1 6.0	6 59 49.0	+ 1 8.0	9.610 6988	55384
	16	323 34 9.5	3 43 36.5	- 2 43.6	-6 57 48.8	+ 2 53.7	9.605 0402	-57772
	17	327 20 46.8	3 49 41.8	4 21.1	6 53 59.0	4 47.1	9.599 1485	60040
	18	331 13 40.6	3 56 9.4	5 56.6	6 48 11.3	6 49.4	9.593 0371	62162
	19	335 13 13.2	4 2 59.6	7 28.0	6 40 17.5	8 59.8	9.586 7222	64101
	20	339 19 47.3	4 10 12.4	8 53.1	6 30 8.8	11 19.0	9.580 2243	65819
	21	343 33 45.2	4 17 47.0	-10 9.4	-6 17 36.6	+13 46.8	9.573 5674	-67268
	22	347 55 28.3	4 25 42.7	11 14.2	6 2 32.4	16 22.8	9.566 7817	68389
	23	352 25 17.3	4 33 58.4	12 4.8	5 44 48.4	19 6.4	9.559 9024	69128
	24	357 3 31.1	4 42 31.8	12 38.3	5 24 17.5	21 56.4	9.552 9709	69422
	25	1 50 26.1	4 51 20.4	12 52.1	5 0 54.0	24 51.2	9.546 0353	69197
	26	6 46 15.6	5 0 20.2	-12 43.9	-4 34 34.2	+27 48.6	9.539 1512	-68382
	27	11 51 8.7	5 9 26.8	12 11.8	4 5 17.0	30 45.6	9.532 3810	66905
	28	17 5 9.7	5 18 34.8	11 14.7	3 33 4.4	33 38.6	9.525 7947	64694
	29	22 28 16.3	5 27 37.0	9 52.4	2 58 2.5	36 23.4	9.519 4687	61690
	30	28 0 19.1	5 36 25.6	8 5.9	2 20 22.2	38 54.6	9.513 4851	57838
	31	33 41 0.0	5 44 51.8	- 5 57.7	-1 40 19.6	+41 6.9	9.507 9303	-53114
	32	39 29 51.8	.....	- 3 31.9	-0 58 16.6	.....	9.502 8917	....

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m	
Jan.	1	15	53	6.99	+ 5.712	-15	57	21.0	-10.75	9.624 5884	+2923.8	19.96	20.89	21	11.2
	2	15	55	26.95	5.950	16	1	54.2	11.09	9.631 5829	2904.7	19.64	20.55	21	9.7
	3	15	57	52.55	6.182	16	6	56.0	13.14	9.638 5298	2884.1	19.33	20.23	21	8.3
	4	16	0	23.61	6.406	16	12	24.4	14.20	9.645 4258	2862.4	19.03	19.91	21	6.9
	5	16	2	59.96	6.622	16	18	17.0	15.17	9.652 2683	2839.5	18.73	19.60	21	5.7
	6	16	5	41.43	+ 6.832	-16	24	31.8	-16.05	9.659 0545	+2815.5	18.44	19.29	21	4.5
	7	16	8	27.85	7.035	16	31	6.7	16.84	9.665 7821	2790.7	18.16	19.00	21	3.4
	8	16	11	19.07	7.232	16	37	59.5	17.55	9.672 4491	2765.1	17.88	18.71	21	2.4
	9	16	14	14.94	7.422	16	45	8.3	18.17	9.679 0539	2738.9	17.61	18.43	21	1.4
	10	16	17	15.30	7.606	16	52	31.0	18.71	9.685 5952	2712.2	17.35	18.15	21	0.6
	11	16	20	20.00	+ 7.785	-17	0	5.8	-19.17	9.692 0719	+2685.0	17.09	17.88	20	59.8
	12	16	23	28.91	7.957	17	7	50.7	19.56	9.698 4831	2657.6	16.84	17.62	20	59.0
	13	16	26	41.87	8.123	17	15	43.9	19.87	9.704 8282	2630.0	16.59	17.36	20	58.4
	14	16	29	58.76	8.284	17	23	43.6	20.10	9.711 1070	2602.3	16.35	17.11	20	57.8
	15	16	33	19.44	8.439	17	31	48.1	20.26	9.717 3193	2574.6	16.12	16.87	20	57.2
	16	16	36	43.79	+ 8.589	-17	39	55.7	-20.36	9.723 4651	+2546.9	15.89	16.63	20	56.7
	17	16	40	11.69	8.735	17	48	4.8	20.39	9.729 5446	2519.4	15.67	16.40	20	56.3
	18	16	43	43.04	8.876	17	56	13.8	20.35	9.735 5582	2492.0	15.46	16.18	20	55.9
	19	16	47	17.72	9.013	18	4	21.2	20.25	9.741 5062	2464.7	15.25	15.96	20	55.6
	20	16	50	55.64	9.146	18	12	25.4	20.09	9.747 3891	2437.7	15.04	15.74	20	55.3
	21	16	54	36.69	+ 9.275	-18	20	25.0	-19.87	9.753 2076	+2411.0	14.84	15.53	20	55.1
	22	16	58	20.79	9.400	18	28	18.7	19.59	9.758 9622	2384.5	14.65	15.33	20	55.0
	23	17	2	7.84	9.521	18	36	5.0	19.26	9.764 6536	2358.3	14.46	15.13	20	54.8
	24	17	5	57.76	9.638	18	43	42.7	18.87	9.770 2823	2332.3	14.27	14.93	20	54.8
	25	17	9	50.46	9.753	18	51	10.5	18.44	9.775 8490	2306.7	14.09	14.74	20	54.8
	26	17	13	45.87	+ 9.864	-18	58	27.2	-17.95	9.781 3545	+2281.3	13.92	14.56	20	54.8
	27	17	17	43.90	9.971	19	5	31.5	17.41	9.786 7993	2256.1	13.74	14.38	20	54.8
	28	17	21	44.47	10.076	19	12	22.3	16.82	9.792 1842	2231.3	13.57	14.20	20	54.9
	29	17	25	47.51	10.177	19	18	58.5	16.19	9.797 5099	2206.8	13.41	14.03	20	55.1
	30	17	29	52.94	10.275	19	25	18.9	15.51	9.802 7770	2182.5	13.25	13.86	20	55.3
Feb.	31	17	34'	0.69	+10.370	-19	31	22.5	-14.79	9.807 9862	+2158.5	13.08	13.69	20	55.5
	1	17	38	10.70	10.463	19	37	8.4	14.03	9.813 1380	2134.8	12.93	13.53	20	55.7
	2	17	42	22.90	10.553	19	42	35.5	13.23	9.818 2333	2111.3	12.78	13.37	20	56.0
	3	17	46	37.20	10.639	19	47	43.0	12.39	9.823 2723	2087.9	12.63	13.22	20	56.4
	4	17	50	53.54	10.722	19	52	29.8	11.51	9.828 2555	2061.8	12.49	13.07	20	56.7
	5	17	55	11.84	+10.802	-19	56	55.1	-10.60	9.833 1835	+2041.9	12.35	12.92	20	57.1
	6	17	59	32.02	10.879	20	0	58.1	9.65	9.838 0566	2019.1	12.21	12.78	20	57.5
	7	18	3	54.01	10.953	20	4	37.9	8.67	9.842 8755	1996.6	12.08	12.64	20	58.0
	8	18	8	17.73	11.023	20	7	53.9	7.66	9.847 6407	1974.4	11.95	12.50	20	58.5
	9	18	12	43.11	11.091	20	10	45.2	6.62	9.852 3530	1952.5	11.81	12.36	20	59.0
	10	18	17	10.06	+11.155	-20	13	11.2	- 5.55	9.857 0129	+1930.8	11.69	12.23	20	59.5
	11	18	21	38.51	11.216	20	15	11.2	4.45	9.861 6212	1909.5	11.56	12.10	21	0.0
	12	18	26	8.38	11.273	20	16	44.7	3.33	9.866 1785	1888.4	11.45	11.98	21	0.6
	13	18	30	39.59	11.327	20	17	51.0	2.19	9.870 6855	1867.6	11.33	11.85	21	1.2
	14	18	35	12.07	11.379	20	18	29.6	- 1.02	9.875 1430	1847.1	11.21	11.73	21	1.8
	15	18	39	45.74	+11.427	-20	18	39.9	+ 0.16	9.879 5517	+1826.9	11.10	11.61	21	2.5
16	18	44	20.54	+11.472	-20	18	21.6	+ 1.37	9.883 9126	+1807.1	10.99	11.50	21	3.1	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb. 16	18	44	20.54	+11.472	-20	18	21.6	+ 1.37	9.883 9126	+1807.1	10.99	11.50	21 3.1
17	18	48	56.38	11.514	20	17	34.2	2.59	9.888 2263	1787.7	10.88	11.38	21 3.8
18	18	53	33.20	11.554	20	16	17.2	3.83	9.892 4939	1768.6	10.77	11.27	21 4.5
19	18	58	10.94	11.590	20	14	30.3	5.08	9.896 7159	1749.8	10.67	11.16	21 5.2
20	19	2	49.52	11.624	20	12	13.2	6.35	9.900 8933	1731.4	10.57	11.06	21 5.9
21	19	7	28.89	+11.656	-20	9	25.5	+ 7.63	9.905 0268	+1713.2	10.46	10.95	21 6.6
22	19	12	8.97	11.684	20	6	7.1	8.91	9.909 1170	1695.3	10.37	10.85	21 7.3
23	19	16	49.70	11.710	20	2	17.6	10.21	9.913 1647	1677.8	10.28	10.75	21 8.1
24	19	21	31.02	11.733	19	57	56.9	11.52	9.917 1707	1660.5	10.18	10.65	21 8.8
25	19	26	12.88	11.754	19	53	4.8	12.82	9.921 1355	1643.6	10.08	10.55	21 9.6
26	19	30	55.21	+11.773	-19	47	41.3	+14.14	9.925 0600	+1626.9	10.00	10.46	21 10.4
27	19	35	37.97	11.790	19	41	46.1	15.46	9.928 9446	1610.4	9.90	10.36	21 11.1
28	19	40	21.10	11.804	19	35	19.1	16.79	9.932 7900	1594.2	9.82	10.27	21 11.9
Mar. 1	19	45	4.54	11.816	19	28	20.4	18.11	9.936 5967	1578.2	9.73	10.18	21 12.7
2	19	49	48.26	11.826	19	20	49.9	19.43	9.940 3653	1562.3	9.65	10.10	21 13.5
3	19	54	32.19	+11.834	-19	12	47.6	+20.76	9.944 0960	+1546.7	9.57	10.01	21 14.3
4	19	59	16.28	11.840	19	4	13.5	22.08	9.947 7894	1531.2	9.48	9.92	21 15.1
5	20	4	0.49	11.844	18	55	7.8	23.39	9.951 4458	1515.9	9.40	9.84	21 15.9
6	20	8	44.78	11.846	18	45	30.6	24.71	9.955 0656	1500.6	9.33	9.76	21 16.7
7	20	13	29.08	11.846	18	35	21.9	26.01	9.958 6490	1485.5	9.25	9.68	21 17.5
8	20	18	13.36	+11.844	-18	24	42.0	+27.31	9.962 1964	+1470.6	9.17	9.60	21 18.2
9	20	22	57.57	11.810	18	13	31.1	28.60	9.965 7082	1455.9	9.10	9.52	21 19.0
10	20	27	41.66	11.834	18	1	49.3	29.88	9.969 1847	1441.2	9.03	9.45	21 19.8
11	20	32	25.59	11.826	17	49	37.0	31.15	9.972 6262	1426.7	8.95	9.37	21 20.6
12	20	37	9.31	11.817	17	36	54.3	32.40	9.976 0332	1412.4	8.89	9.30	21 21.4
13	20	41	52.78	+11.806	-17	23	41.7	+33.65	9.979 4061	+1398.3	8.82	9.23	21 22.2
14	20	46	35.97	11.793	17	9	59.4	34.88	9.982 7454	1384.4	8.75	9.16	21 23.0
15	20	51	18.83	11.779	16	55	47.7	36.09	9.986 0515	1370.7	8.69	9.09	21 23.7
16	20	56	1.34	11.763	16	41	7.1	37.29	9.989 3248	1357.1	8.62	9.02	21 24.5
17	21	0	43.46	11.746	16	25	57.8	38.48	9.992 5658	1343.8	8.55	8.95	21 25.2
18	21	5	25.16	+11.729	-16	10	20.3	+39.65	9.995 7750	+1330.6	8.50	8.89	21 26.0
19	21	10	6.43	11.710	15	54	15.0	40.80	9.998 9530	1317.7	8.43	8.82	21 26.7
20	21	14	47.23	11.690	15	37	42.3	41.93	0.002 1000	1301.9	8.37	8.76	21 27.5
21	21	19	27.54	11.669	15	20	42.7	43.04	0.005 2167	1292.4	8.31	8.69	21 28.2
22	21	24	7.35	11.648	15	3	16.6	44.13	0.008 3035	1280.0	8.25	8.63	21 28.9
23	21	28	46.64	+11.626	-14	45	24.6	+45.20	0.011 3609	+1267.8	8.19	8.57	21 29.6
24	21	33	25.40	11.604	14	27	7.0	46.26	0.014 3892	1255.8	8.13	8.51	21 30.3
25	21	38	3.62	11.581	14	8	24.4	47.29	0.017 3889	1244.0	8.08	8.45	21 31.0
26	21	42	41.28	11.558	13	49	17.2	48.30	0.020 3604	1232.3	8.03	8.40	21 31.7
27	21	47	18.38	11.531	13	29	46.1	49.29	0.023 3042	1220.8	7.97	8.34	21 32.3
28	21	51	54.93	+11.511	-13	9	51.5	+50.26	0.026 2205	+1209.5	7.91	8.28	21 33.0
29	21	56	30.91	11.488	12	49	33.9	51.21	0.029 1098	1198.3	7.87	8.23	21 33.6
30	22	1	6.34	11.465	12	28	53.8	52.13	0.031 9725	1187.3	7.81	8.17	21 34.3
31	22	5	41.21	11.441	12	7	51.9	53.03	0.034 8088	1176.3	7.76	8.12	21 34.9
Apr. 1	22	10	15.53	11.418	11	46	28.7	53.90	0.037 6188	1165.4	7.71	8.07	21 35.5
2	22	14	49.30	+11.396	-11	24	44.7	+54.76	0.040 4028	+1154.6	7.66	8.02	21 36.1
3	22	19	22.54	+11.374	-11	2	40.5	+55.59	0.043 1611	+1143.9	7.62	7.97	21 36.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paralax.	Transit, Meridian of Greenwich.
	h	m	s		°	'	"							h	m
Apr.	1	22	10 15.53	+11.418	-11	46	28.7	+53.90	0.037 6188	+1165.4	7.71	8.07	21 35.5
	2	22	14 49.30	11.396	11	24	44.7	54.76	0.040 4028	1154.6	7.66	8.02	21 36.1
	3	22	19 22.54	11.374	11	2	40.5	55.59	0.043 1611	1143.9	7.62	7.97	21 36.7
	4	22	23 55.25	11.352	10	40	16.6	56.40	0.045 8936	1133.2	7.57	7.92	21 37.3
	5	22	28 27.44	11.331	10	17	33.7	57.18	0.048 6006	1122.6	7.52	7.87	21 37.9
	6	22	32 59.12	+11.310	-9	54	32.4	+57.93	0.051 2822	+1112.0	7.47	7.82	21 38.5
	7	22	37 30.30	11.289	9	31	13.2	58.66	0.053 9383	1101.5	7.43	7.77	21 39.1
	8	22	42 0.98	11.268	9	7	36.8	59.37	0.056 5693	1091.0	7.38	7.72	21 39.6
	9	22	46 31.19	11.249	8	43	43.8	60.04	0.059 1753	1080.7	7.34	7.68	21 40.2
	10	22	51 0.93	11.230	8	19	34.9	60.69	0.061 7565	1070.4	7.29	7.63	21 40.7
	11	22	55 30.21	+11.211	-7	55	10.6	+61.32	0.064 3131	+1060.1	7.25	7.59	21 41.3
	12	22	59 59.05	11.193	7	30	31.7	61.92	0.066 8452	1050.0	7.21	7.54	21 41.8
	13	23	4 27.47	11.176	7	5	38.7	62.49	0.069 3532	1040.0	7.17	7.50	21 42.3
	14	23	8 55.48	11.159	6	40	32.3	63.03	0.071 8372	1030.0	7.13	7.46	21 42.9
	15	23	13 23.10	11.143	6	15	13.2	63.55	0.074 2975	1020.2	7.09	7.42	21 43.4
	16	23	17 50.36	+11.128	-5	49	41.9	+64.05	0.076 7343	+1010.5	7.04	7.37	21 43.9
	17	23	22 17.27	11.114	5	23	59.2	64.51	0.079 1478	1000.8	7.01	7.33	21 44.4
	18	23	26 43.85	11.101	4	58	5.6	64.95	0.081 5383	991.3	6.97	7.29	21 44.9
	19	23	31 10.13	11.089	4	32	1.8	65.36	0.083 9061	981.9	6.93	7.25	21 45.4
	20	23	35 36.13	11.078	4	5	48.5	65.74	0.086 2514	972.6	6.89	7.21	21 45.8
	21	23	40 1.88	+11.068	-3	39	26.3	+66.10	0.088 5746	+963.4	6.86	7.18	21 46.3
	22	23	44 27.40	11.059	3	12	55.9	66.43	0.090 8758	954.3	6.82	7.14	21 46.8
	23	23	48 52.73	11.052	2	46	17.9	66.73	0.093 1553	945.3	6.78	7.10	21 47.3
	24	23	53 17.89	11.045	2	19	32.9	67.01	0.095 4134	936.1	6.75	7.06	21 47.8
	25	23	57 42.92	11.040	1	52	41.6	67.26	0.097 6503	927.6	6.72	7.03	21 48.2
	26	0	2 7.84	+11.037	-1	25	44.6	+67.48	0.099 8662	+919.0	6.68	6.99	21 48.7
	27	0	6 32.69	11.035	0	58	42.6	67.68	0.102 0614	910.4	6.65	6.96	21 49.2
	28	0	10 57.51	11.031	0	31	36.1	67.85	0.104 2361	901.8	6.61	6.92	21 49.6
	29	0	15 22.32	11.034	-0	4	25.9	67.99	0.106 3903	893.3	6.58	6.89	21 50.1
	30	0	19 47.17	11.037	+0	22	47.4	68.11	0.108 5242	884.9	6.55	6.85	21 50.6
May	1	0	24 12.09	+11.040	+0	50	3.3	+68.20	0.110 6380	+876.6	6.52	6.82	21 51.1
	2	0	28 37.11	11.045	1	17	21.0	68.27	0.112 7317	868.2	6.49	6.79	21 51.5
	3	0	33 2.27	11.052	1	44	40.0	68.31	0.114 8052	859.8	6.45	6.75	21 52.0
	4	0	37 27.60	11.060	2	11	59.5	68.32	0.116 8587	851.4	6.42	6.72	21 52.5
	5	0	41 53.14	11.069	2	39	18.9	68.30	0.118 8921	843.1	6.39	6.69	21 53.0
	6	0	46 18.92	+11.080	+3	6	37.6	+68.26	0.120 9054	+831.7	6.36	6.66	21 53.5
	7	0	50 44.98	11.092	3	33	54.9	68.18	0.122 8987	826.4	6.34	6.63	21 54.0
	8	0	55 11.34	11.105	4	1	10.0	68.08	0.124 8719	818.0	6.31	6.60	21 54.5
	9	0	59 38.03	11.120	4	28	22.4	67.95	0.126 8252	809.7	6.28	6.57	21 55.0
	10	1	4 5.09	11.136	4	55	31.3	67.79	0.128 7586	801.5	6.25	6.54	21 55.5
	11	1	8 32.55	+11.153	+5	22	36.1	+67.80	0.130 6722	+793.2	6.22	6.51	21 56.0
	12	1	13 0.44	11.171	5	49	36.0	67.39	0.132 5660	785.0	6.19	6.48	21 56.6
	13	1	17 28.78	11.191	6	16	30.5	67.15	0.134 4402	776.8	6.17	6.46	21 57.1
	14	1	21 57.62	11.212	6	43	18.8	66.87	0.136 2949	768.7	6.15	6.43	21 57.6
	15	1	26 26.98	11.235	7	10	0.2	66.57	0.138 1302	760.7	6.12	6.40	21 58.2
	16	1	30 56.89	+11.258	+7	36	34.0	+66.24	0.139 9462	+752.7	6.10	6.38	21 58.8
	17	1	35 27.38	+11.283	+8	2	59.6	+65.89	0.141 7430	+744.7	6.07	6.35	21 59.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"					h	m	
May	17	1	35	27.38	+11.283	+ 8	2	59.6	+65.89	0.141 7430	+744.7	6.07	6.35	21 59.3	
	18	1	39	58.48	11.309	8	29	16.3	65.50	0.143 5209	736.8	6.04	6.32	21 59.9	
	19	1	44	30.23	11.336	8	55	23.4	65.08	0.145 2798	729.0	6.02	6.30	22 0.5	
	20	1	49	2.64	11.365	9	21	20.1	64.64	0.147 0200	721.2	5.99	6.27	22 1.1	
	21	1	53	35.75	11.395	9	47	5.8	64.16	0.148 7416	713.5	5.97	6.25	22 1.7	
	22	1	58	9.59	+11.426	+10	12	39.8	+63.66	0.150 4448	+705.9	5.94	6.22	22 2.4	
	23	2	2	44.19	11.458	10	38	1.5	63.13	0.152 1298	698.3	5.93	6.20	22 3.0	
	24	2	7	19.57	11.491	11	3	10.0	62.57	0.153 7967	690.8	5.91	6.18	22 3.7	
	25	2	11	55.77	11.526	11	28	4.8	61.99	0.155 4456	683.3	5.88	6.15	22 4.4	
	26	2	16	32.82	11.562	11	52	45.1	61.37	0.157 0767	675.9	5.86	6.13	22 5.1	
	27	2	21	10.74	+11.599	+12	17	10.3	+60.72	0.158 6901	+668.6	5.84	6.11	22 5.8	
	28	2	25	49.57	11.637	12	41	19.6	60.05	0.160 2859	661.3	5.81	6.08	22 6.5	
	29	2	30	29.32	11.676	13	5	12.4	59.35	0.161 8643	654.0	5.79	6.06	22 7.2	
	30	2	35	10.03	11.716	13	28	48.0	58.62	0.163 4253	646.8	5.77	6.04	22 8.0	
	31	2	39	51.71	11.758	13	52	5.7	57.86	0.164 9688	639.5	5.75	6.02	22 8.7	
	June	1	2	44	34.40	+11.800	+14	15	4.8	+57.07	0.166 4948	+632.2	5.73	6.00	22 9.5
		2	2	49	18.11	11.843	14	37	44.6	56.25	0.168 0033	624.9	5.72	5.98	22 10.3
		3	2	54	2.85	11.886	15	0	4.4	55.40	0.169 4942	617.5	5.70	5.96	22 11.1
		4	2	58	48.65	11.930	15	22	3.5	54.52	0.170 9675	610.2	5.68	5.94	22 12.0
		5	3	3	35.52	11.975	15	43	41.2	53.61	0.172 4233	602.9	5.66	5.92	22 12.8
6		3	8	23.47	+12.021	+16	4	56.7	+52.68	0.173 8614	+595.6	5.64	5.90	22 13.7	
7		3	13	12.52	12.067	16	25	49.5	51.71	0.175 2820	588.2	5.62	5.88	22 14.6	
8		3	18	2.67	12.113	16	46	18.7	50.72	0.176 6849	580.9	5.60	5.86	22 15.5	
9		3	22	53.93	12.159	17	6	23.7	49.69	0.178 0703	573.6	5.58	5.84	22 16.4	
10		3	27	46.30	12.205	17	26	3.8	48.64	0.179 4381	566.3	5.56	5.82	22 17.4	
	11	3	32	39.79	+12.252	+17	45	18.4	+47.56	0.180 7884	+559.0	5.54	5.80	22 18.3	
	12	3	37	34.39	12.298	18	4	6.6	46.45	0.182 1211	551.6	5.52	5.78	22 19.3	
	13	3	42	30.10	12.344	18	22	27.9	45.31	0.183 4363	544.3	5.51	5.77	22 20.3	
	14	3	47	26.92	12.391	18	40	21.5	44.15	0.184 7340	537.1	5.50	5.75	22 21.4	
	15	3	52	24.85	12.437	18	57	46.8	42.96	0.186 0144	529.9	5.48	5.73	22 22.4	
	16	3	57	23.88	+12.482	+19	14	43.1	+41.73	0.187 2774	+522.7	5.47	5.72	22 23.5	
	17	4	2	24.00	12.527	19	31	9.7	40.48	0.188 5233	515.6	5.45	5.70	22 24.5	
	18	4	7	25.19	12.572	19	47	6.1	39.21	0.189 7521	508.5	5.43	5.68	22 25.6	
	19	4	12	27.45	12.616	20	2	31.6	37.91	0.190 9639	501.4	5.42	5.67	22 26.7	
	20	4	17	30.76	12.660	20	17	25.6	36.58	0.192 1588	494.4	5.40	5.65	22 27.9	
	21	4	22	35.10	+12.702	+20	31	47.5	+35.23	0.193 3370	+487.4	5.39	5.64	22 29.0	
	22	4	27	40.45	12.744	20	45	36.6	33.86	0.194 4985	480.5	5.37	5.62	22 30.2	
	23	4	32	46.79	12.785	20	58	52.5	32.46	0.195 6435	473.7	5.36	5.61	22 31.4	
	24	4	37	54.11	12.825	21	11	34.5	31.04	0.196 7722	466.9	5.34	5.59	22 32.6	
	25	4	43	2.37	12.863	21	23	42.2	29.60	0.197 8845	460.1	5.33	5.58	22 33.8	
	26	4	48	11.55	+12.901	+21	35	14.9	+28.13	0.198 9808	+453.4	5.32	5.57	22 35.0	
	27	4	53	21.63	12.938	21	46	12.2	26.64	0.200 0609	446.7	5.30	5.55	22 36.2	
	28	4	58	32.58	12.974	21	56	33.5	25.13	0.201 1249	440.0	5.29	5.54	22 37.5	
	29	5	3	44.37	13.008	22	6	18.4	23.61	0.202 1727	433.2	5.28	5.52	22 38.8	
	30	5	8	56.97	13.041	22	15	26.5	22.06	0.203 2045	426.5	5.27	5.51	22 40.0	
July	1	5	14	10.33	+13.072	+22	23	57.3	+20.50	0.204 2201	+419.8	5.26	5.50	22 41.3	
	2	5	19	24.42	+13.102	+22	31	50.4	+18.92	0.205 2196	+413.1	5.25	5.49	22 42.6	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Paralax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July 1	5	14	10.33	+13.072	+22	23	57.3	+20.50	0.204 2201	+419.8	5.26	5.50	22 41.3
2	5	19	24.42	13.102	22	31	50.4	18.92	0.205 2196	413.1	5.25	5.49	22 42.6
3	5	24	39.20	13.130	22	39	5.4	17.32	0.206 2028	406.3	5.23	5.47	22 43.9
4	5	29	54.62	13.156	22	45	41.9	15.71	0.207 1698	399.5	5.22	5.46	22 45.3
5	5	35	10.65	13.180	22	51	39.6	14.09	0.208 1206	392.8	5.21	5.45	22 46.6
6	5	40	27.23	+13.202	+22	56	58.2	+12.45	0.209 0550	+386.0	5.20	5.44	22 47.9
7	5	45	44.31	13.222	23	1	37.3	10.80	0.209 9732	379.2	5.19	5.43	22 49.3
8	5	51	1.85	13.240	23	5	36.7	9.14	0.210 8751	372.4	5.17	5.41	22 50.7
9	5	56	19.79	13.255	23	8	56.2	7.48	0.211 7606	365.6	5.16	5.40	22 52.0
10	6	1	38.08	13.269	23	11	35.6	5.80	0.212 6299	358.8	5.15	5.39	22 53.4
11	6	6	56.67	+13.280	+23	13	34.5	+4.11	0.213 4828	+352.0	5.14	5.38	22 54.8
12	6	12	15.50	13.289	23	14	53.0	2.42	0.214 3195	345.2	5.13	5.37	22 56.1
13	6	17	34.51	13.295	23	15	30.8	+0.72	0.215 1398	338.4	5.12	5.36	22 57.5
14	6	22	53.64	13.299	23	15	27.8	-0.97	0.215 9440	331.7	5.11	5.35	22 58.9
15	6	28	12.85	13.301	23	14	44.0	2.67	0.216 7320	325.0	5.10	5.34	23 0.3
16	6	33	32.08	+13.301	+23	13	19.4	-4.38	0.217 5038	+318.2	5.09	5.33	23 1.6
17	6	38	51.26	13.297	23	11	13.9	6.08	0.218 2596	311.6	5.08	5.32	23 3.0
18	6	44	10.34	13.292	23	8	27.5	7.78	0.218 9995	305.0	5.07	5.31	23 4.4
19	6	49	29.27	13.285	23	5	0.3	9.48	0.219 7236	298.4	5.07	5.30	23 5.8
20	6	54	47.99	13.275	23	0	52.4	11.18	0.220 4320	291.9	5.06	5.30	23 7.1
21	7	0	6.45	+13.263	+22	56	3.8	-12.87	0.221 1248	+285.5	5.06	5.29	23 8.5
22	7	5	24.59	13.219	22	50	34.7	14.55	0.221 8022	279.0	5.05	5.28	23 9.9
23	7	10	42.37	13.233	22	44	25.4	16.23	0.222 4642	272.7	5.04	5.27	23 11.2
24	7	15	59.74	13.215	22	37	35.9	17.90	0.223 1111	266.4	5.03	5.26	23 12.5
25	7	21	16.65	13.195	22	30	6.5	19.56	0.223 7428	260.1	5.03	5.26	23 13.9
26	7	26	33.06	+13.173	+22	21	57.3	-21.20	0.224 3594	+253.8	5.02	5.25	23 15.2
27	7	31	48.93	13.149	22	13	8.8	22.84	0.224 9610	247.6	5.01	5.24	23 16.5
28	7	37	4.21	13.124	22	3	41.1	24.46	0.225 5477	241.3	5.00	5.23	23 17.8
29	7	42	18.86	13.097	21	53	34.6	26.07	0.226 1194	235.1	5.00	5.23	23 19.1
30	7	47	32.84	13.068	21	42	49.6	27.67	0.226 6762	228.9	4.99	5.22	23 20.4
31	7	52	46.12	+13.038	+21	31	26.5	-29.25	0.227 2180	+222.6	4.98	5.21	23 21.7
Aug. 1	7	57	58.66	13.006	21	19	25.7	30.81	0.227 7449	216.4	4.98	5.21	23 22.9
2	8	3	10.42	12.973	21	6	47.6	32.36	0.228 2568	210.2	4.97	5.20	23 24.2
3	8	8	21.37	12.939	20	53	32.7	33.88	0.228 7537	203.9	4.97	5.20	23 25.4
4	8	13	31.49	12.904	20	39	41.4	35.39	0.229 2356	197.7	4.96	5.19	23 26.6
5	8	18	40.74	+12.867	+20	25	14.2	-36.87	0.229 7025	+191.4	4.95	5.18	23 27.8
6	8	23	49.09	12.829	20	10	11.6	38.34	0.230 1544	185.2	4.95	5.18	23 29.0
7	8	28	56.53	12.790	19	54	34.0	39.79	0.230 5913	178.9	4.94	5.17	23 30.1
8	8	34	3.02	12.750	19	38	22.1	41.20	0.231 0131	172.6	4.94	5.17	23 31.3
9	8	39	8.55	12.710	19	21	36.4	42.60	0.231 4199	166.4	4.93	5.16	23 32.4
10	8	44	13.10	+12.669	+19	4	17.4	-43.98	0.231 8117	+160.1	4.93	5.16	23 33.5
11	8	49	16.65	12.627	18	46	25.7	45.33	0.232 1884	153.9	4.93	5.16	23 34.6
12	8	54	19.19	12.584	18	28	2.0	46.65	0.232 5502	147.6	4.92	5.15	23 35.7
13	8	59	20.70	12.541	18	9	6.9	47.94	0.232 8970	141.4	4.92	5.15	23 36.8
14	9	4	21.17	12.498	17	49	40.9	49.21	0.233 2290	135.3	4.91	5.14	23 37.8
15	9	9	20.60	+12.454	+17	29	44.8	-50.46	0.233 5463	+129.1	4.91	5.14	23 38.9
16	9	14	18.97	+12.410	+17	9	19.1	-51.68	0.233 8488	+123.0	4.91	5.14	23 39.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Aug. 16	9 14 18.97	+12.410	+17 9 19.1	-51.68	0.233 8488	+123.0	4.91	5.14	23 39.9
17	9 19 16.29	12.366	16 48 24.5	52.87	0.234 1368	117.0	4.90	5.13	23 40.9
18	9 24 12.55	12.322	16 27 1.7	54.03	0.234 4103	111.0	4.90	5.13	23 41.9
19	9 29 7.76	12.279	16 5 11.4	55.16	0.234 6696	105.1	4.90	5.13	23 42.8
20	9 34 1.93	12.235	15 42 54.2	56.27	0.234 9147	99.2	4.89	5.12	23 43.8
21	9 38 55.05	+12.192	+15 20 10.8	-57.31	0.235 1458	+ 93.4	4.89	5.12	23 44.7
22	9 43 47.15	12.150	14 57 1.9	58.39	0.235 3630	87.6	4.89	5.12	23 45.6
23	9 48 38.23	12.108	14 33 28.1	59.41	0.235 5663	81.9	4.89	5.12	23 46.5
24	9 53 28.32	12.066	14 9 30.3	60.40	0.235 7559	76.1	4.88	5.11	23 47.4
25	9 58 17.42	12.025	13 45 9.0	61.37	0.235 9318	70.4	4.88	5.11	23 48.2
26	10 3 5.55	+11.985	+13 20 24.9	-62.30	0.236 0941	+ 64.8	4.88	5.11	23 49.1
27	10 7 52.73	11.946	12 55 18.8	63.20	0.236 2429	59.2	4.88	5.11	23 49.9
28	10 12 38.99	11.909	12 29 51.4	61.08	0.236 3783	53.6	4.88	5.11	23 50.7
29	10 17 24.35	11.872	12 4 3.3	64.92	0.236 5002	48.0	4.87	5.10	23 51.5
30	10 22 8.84	11.836	11 37 55.4	65.74	0.236 6088	42.4	4.87	5.10	23 52.3
31	10 26 52.47	+11.800	+11 11 28.2	-66.52	0.236 7038	+ 36.8	4.87	5.10	23 53.1
Sept. 1	10 31 35.27	11.767	10 44 42.6	67.27	0.236 7855	31.2	4.87	5.10	23 53.8
2	10 36 17.28	11.734	10 17 39.3	68.00	0.236 8536	25.6	4.87	5.10	23 54.6
3	10 40 58.51	11.702	9 50 18.9	68.69	0.236 9083	20.0	4.87	5.10	23 55.3
4	10 45 39.01	11.672	9 22 42.2	69.36	0.236 9496	14.4	4.87	5.10	23 56.0
5	10 50 18.79	+11.643	+ 8 54 49.9	-69.99	0.236 9774	+ 8.8	4.87	5.10	23 56.7
6	10 54 57.90	11.616	8 26 42.8	70.60	0.236 9919	+ 3.2	4.87	5.10	23 57.5
7	10 59 36.36	11.590	7 58 21.5	71.17	0.236 9929	- 2.4	4.87	5.10	23 58.1
8	11 4 14.21	11.565	7 29 46.9	71.71	0.236 9804	8.0	4.87	5.10	23 58.8
9	11 8 51.47	11.541	7 0 59.6	72.22	0.236 9545	13.6	4.87	5.10	23 59.5
10	11 13 28.18	+11.519	+ 6 32 0.4	-72.70	0.236 9152	- 19.2	4.87	5.10	. . . . .
11	11 18 4.38	11.498	6 2 50.0	73.15	0.236 8624	24.8	4.87	5.10	0 0.2
12	11 22 40.09	11.479	5 33 29.2	73.57	0.236 7963	30.3	4.87	5.10	0 0.8
13	11 27 15.36	11.461	5 3 58.7	73.96	0.236 7170	35.8	4.87	5.10	0 1.5
14	11 31 50.22	11.444	4 34 19.3	74.32	0.236 6244	41.3	4.87	5.10	0 2.1
15	11 36 24.70	+11.429	+ 4 4 31.6	-74.65	0.236 5188	- 46.7	4.87	5.10	0 2.7
16	11 40 58.85	11.416	3 34 36.5	71.94	0.236 4002	52.1	4.88	5.11	0 3.3
17	11 45 32.69	11.405	3 4 34.7	75.21	0.236 2688	57.4	4.88	5.11	0 4.0
18	11 50 6.28	11.395	2 34 26.8	75.44	0.236 1248	62.6	4.88	5.11	0 4.6
19	11 54 39.65	11.386	2 4 13.7	75.64	0.235 9682	67.9	4.88	5.11	0 5.2
20	11 59 12.84	+11.380	+ 1 33 56.1	-75.82	0.235 7991	- 73.0	4.88	5.11	0 5.8
21	12 3 45.90	11.375	1 3 34.6	75.97	0.235 6177	78.1	4.88	5.11	0 6.4
22	12 8 18.87	11.372	0 33 10.0	76.08	0.235 4242	83.2	4.89	5.12	0 7.0
23	12 12 51.79	11.371	+ 0 2 43.1	76.16	0.235 2185	88.2	4.89	5.12	0 7.6
24	12 17 24.71	11.372	- 0 27 45.5	76.21	0.235 0007	93.2	4.89	5.12	0 8.2
25	12 21 57.67	+11.375	- 0 58 14.9	-76.23	0.234 7710	- 98.2	4.89	5.12	0 8.8
26	12 26 30.72	11.380	1 28 44.5	76.23	0.234 5293	103.2	4.90	5.13	0 9.5
27	12 31 3.90	11.386	1 59 13.5	76.19	0.234 2756	108.2	4.90	5.13	0 10.1
28	12 35 37.25	11.394	2 29 41.3	76.12	0.234 0100	113.1	4.90	5.13	0 10.7
29	12 40 10.81	11.404	3 0 7.0	76.02	0.233 7326	118.0	4.91	5.14	0 11.3
30	12 44 44.64	+11.416	- 3 30 30.0	-75.89	0.233 4434	-123.0	4.91	5.14	0 11.9
Oct. 1	12 49 18.77	+11.429	- 4 0 49.4	-75.73	0.233 1423	-127.9	4.91	5.14	0 12.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.		
	h	m	s	s	°	'	"	"			"	"	h m	
Oct.	1	12	49	18.77	+11.429	- 4	0	49.4	-75.73	0.233 1423	-127.9	4.91	5.14	0 12.5
	2	12	53	53.25	11.444	4	31	4.6	75.54	0.232 8294	132.9	4.92	5.15	0 13.2
	3	12	58	28.11	11.461	5	1	14.8	75.31	0.232 5046	137.8	4.92	5.15	0 13.8
	4	13	3	3.41	11.480	5	31	19.2	75.05	0.232 1680	142.7	4.93	5.16	0 14.5
	5	13	7	39.18	11.501	6	1	17.1	74.77	0.231 8195	147.7	4.93	5.16	0 15.1
	6	13	12	15.46	+11.523	- 6	31	7.7	-74.45	0.231 4590	-152.7	4.93	5.16	0 15.8
	7	13	16	52.30	11.547	7	0	50.2	74.09	0.231 0865	157.7	4.94	5.17	0 16.4
	8	13	21	29.73	11.573	7	30	23.9	73.71	0.230 7021	162.7	4.94	5.17	0 17.1
	9	13	26	7.79	11.600	7	59	48.1	73.30	0.230 3056	167.7	4.95	5.18	0 17.8
	10	13	30	46.52	11.628	8	29	1.9	72.85	0.229 8971	172.7	4.95	5.18	0 18.5
	11	13	35	25.95	+11.658	- 8	58	4.6	-72.37	0.229 4767	-177.7	4.96	5.19	0 19.2
	12	13	40	6.12	11.690	9	26	55.3	71.85	0.229 0442	182.7	4.96	5.19	0 20.0
	13	13	44	47.06	11.722	9	55	33.3	71.30	0.228 5999	187.6	4.97	5.20	0 20.7
	14	13	49	28.80	11.756	10	23	57.7	70.72	0.228 1437	192.5	4.97	5.20	0 21.5
	15	13	54	11.37	11.792	10	52	7.8	70.11	0.227 6758	197.4	4.98	5.21	0 22.2
	16	13	58	54.82	+11.829	-11	20	2.8	-69.46	0.227 1963	-202.2	4.99	5.22	0 23.0
	17	14	3	39.17	11.867	11	47	41.8	68.78	0.226 7052	207.0	4.99	5.22	0 23.8
	18	14	8	24.45	11.907	12	15	4.2	68.07	0.226 2028	211.7	5.00	5.23	0 24.6
	19	14	13	10.70	11.948	12	42	9.0	67.32	0.225 6890	216.4	5.00	5.23	0 25.5
	20	14	17	57.95	11.990	13	8	55.5	66.55	0.225 1640	221.1	5.01	5.24	0 26.3
	21	14	22	46.23	+12.033	-13	35	23.0	-65.74	0.224 6279	-225.7	5.02	5.25	0 27.2
	22	14	27	35.56	12.078	14	1	30.5	64.89	0.224 0807	230.3	5.02	5.25	0 28.0
	23	14	32	25.96	12.123	14	27	17.4	64.01	0.223 5225	234.9	5.03	5.26	0 28.9
	24	14	37	17.47	12.170	14	52	42.8	63.10	0.222 9533	239.5	5.04	5.27	0 29.9
	25	14	42	10.11	12.217	15	17	45.9	62.15	0.222 3731	244.0	5.04	5.27	0 30.8
	26	14	47	3.91	+12.266	-15	42	25.9	-61.18	0.221 7821	-248.5	5.05	5.28	0 31.8
	27	14	51	58.88	12.315	16	6	42.1	60.17	0.221 1802	253.1	5.06	5.29	0 32.7
	28	14	56	55.04	12.365	16	30	33.6	59.12	0.220 5674	257.6	5.07	5.30	0 33.7
	29	15	1	52.40	12.416	16	53	59.7	58.04	0.219 9437	262.1	5.07	5.30	0 34.7
	30	15	6	50.99	12.467	17	16	59.5	56.93	0.219 3091	266.7	5.07	5.31	0 35.8
	31	15	11	50.81	+12.518	-17	39	32.3	-55.79	0.218 6636	-271.2	5.08	5.32	0 36.8
Nov.	1	15	16	51.88	12.571	18	1	37.3	54.62	0.218 0071	275.8	5.09	5.33	0 37.9
	2	15	21	54.20	12.623	18	23	13.7	53.41	0.217 3397	280.4	5.09	5.33	0 39.0
	3	15	26	57.78	12.675	18	44	20.7	52.17	0.216 6611	285.1	5.10	5.34	0 40.1
	4	15	32	2.61	12.728	19	4	57.5	50.89	0.215 9713	289.7	5.11	5.35	0 41.3
	5	15	37	8.70	+12.780	-19	25	3.4	-49.59	0.215 2704	-294.4	5.12	5.36	0 42.4
	6	15	42	16.03	12.831	19	44	37.7	48.26	0.214 5581	299.1	5.13	5.37	0 43.6
	7	15	47	24.60	12.883	20	3	39.5	46.89	0.213 8345	303.9	5.14	5.38	0 44.8
	8	15	52	34.40	12.934	20	22	8.1	45.49	0.213 0995	308.7	5.15	5.39	0 46.0
	9	15	57	45.42	12.984	20	40	2.8	44.06	0.212 3529	313.5	5.16	5.40	0 47.3
	10	16	2	57.63	+13.033	-20	57	22.9	-42.61	0.211 5949	-318.3	5.17	5.41	0 48.5
	11	16	8	11.02	13.082	21	14	7.7	41.12	0.210 8252	323.1	5.17	5.41	0 49.8
	12	16	13	25.56	13.129	21	30	16.4	39.60	0.210 0441	327.9	5.18	5.42	0 51.1
	13	16	18	41.22	13.176	21	45	48.3	38.06	0.209 2515	332.6	5.19	5.43	0 52.4
	14	16	23	57.98	13.221	22	0	42.9	36.49	0.208 4475	337.4	5.20	5.44	0 53.8
	15	16	29	15.80	+13.264	-22	14	59.5	-34.89	0.207 6322	-342.1	5.21	5.45	0 55.1
	16	16	34	34.65	+13.306	-22	28	37.4	-33.27	0.206 8055	-346.8	5.22	5.46	0 56.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"		"	"	"	h m
Nov. 16	16 34 34.65	+13.306	-22 28 37.4	-33.27	0.206 8055	-346.8	5.22	5.46	0 56.5
17	16 39 54.50	13.348	22 41 36.1	31.62	0.205 9676	351.5	5.24	5.48	0 57.9
18	16 45 15.32	13.387	22 53 54.9	29.95	0.205 1185	356.1	5.25	5.49	0 59.3
19	16 50 37.05	13.424	23 5 33.4	28.25	0.204 2583	360.8	5.26	5.50	1 0.7
20	16 55 59.65	13.459	23 16 30.9	26.54	0.203 3869	365.4	5.27	5.51	1 2.1
21	17 1 23.09	+13.493	-23 26 47.0	-24.80	0.202 5044	-370.0	5.28	5.52	1 3.6
22	17 6 47.31	13.525	23 36 21.3	23.05	0.201 6108	374.6	5.29	5.53	1 5.1
23	17 12 12.27	13.554	23 45 13.2	21.27	0.200 7061	379.3	5.29	5.54	1 6.5
24	17 17 37.90	13.582	23 53 22.3	19.48	0.199 7903	383.9	5.30	5.55	1 8.0
25	17 23 4.17	13.607	24 0 48.3	17.68	0.198 8634	388.5	5.32	5.57	1 9.5
26	17 28 31.02	+13.630	-24 7 30.8	-15.86	0.197 9253	-393.2	5.33	5.58	1 11.0
27	17 33 58.38	13.650	24 13 29.5	14.03	0.196 9761	397.9	5.34	5.59	1 12.6
28	17 39 26.20	13.668	24 18 44.1	12.19	0.196 0156	402.5	5.35	5.60	1 14.1
29	17 44 54.42	13.683	24 23 14.3	10.33	0.195 0439	407.2	5.37	5.62	1 15.6
30	17 50 22.98	13.696	24 26 59.8	8.46	0.194 0608	412.0	5.38	5.63	1 17.1
Dec. 1	17 55 51.81	+13.706	-24 30 0.5	- 6.59	0.193 0663	-416.8	5.39	5.64	1 18.7
2	18 1 20.85	13.713	24 32 16.2	4.71	0.192 0602	421.7	5.40	5.65	1 20.2
3	18 6 50.03	13.718	24 33 46.8	2.84	0.191 0423	426.6	5.42	5.67	1 21.8
4	18 12 19.29	13.720	24 34 32.3	-- 0.95	0.190 0125	431.6	5.43	5.68	1 23.3
5	18 17 48.56	13.719	24 34 32.4	+ 0.94	0.188 9707	436.6	5.44	5.69	1 24.9
6	18 23 17.76	+13.715	-24 33 47.2	+ 2.82	0.187 9167	-441.7	5.46	5.71	1 26.4
7	18 28 46.84	13.708	24 32 16.8	4.71	0.186 8504	446.9	5.47	5.72	1 27.9
8	18 34 15.71	13.698	24 30 1.1	6.59	0.185 7717	452.1	5.49	5.74	1 29.5
9	18 39 44.31	13.685	24 27 0.3	8.47	0.184 6805	457.3	5.50	5.75	1 31.0
10	18 45 12.56	13.669	24 23 14.5	10.35	0.183 5767	462.6	5.51	5.77	1 32.6
11	18 50 40.40	+13.650	-24 18 43.8	+12.21	0.182 4601	-467.9	5.52	5.78	1 34.1
12	18 56 7.76	13.629	24 13 28.5	14.07	0.181 3309	473.2	5.54	5.80	1 35.6
13	19 1 34.57	13.605	24 7 28.7	15.91	0.180 1888	478.5	5.55	5.81	1 37.1
14	19 7 0.76	13.578	24 0 44.8	17.75	0.179 0340	483.8	5.57	5.83	1 38.6
15	19 12 26.28	13.548	23 53 17.0	19.57	0.177 8664	489.1	5.58	5.84	1 40.1
16	19 17 51.06	+13.516	-23 45 5.6	+21.38	0.176 6861	-494.5	5.60	5.86	1 41.5
17	19 23 15.05	13.482	23 36 11.0	23.17	0.175 4929	499.9	5.61	5.87	1 43.0
18	19 28 38.19	13.446	23 26 33.6	24.94	0.174 2868	505.2	5.63	5.89	1 44.4
19	19 34 0.43	13.407	23 16 13.8	26.70	0.173 0679	510.6	5.65	5.91	1 45.9
20	19 39 21.73	13.367	23 5 12.0	28.44	0.171 8361	516.0	5.66	5.92	1 47.3
21	19 44 42.02	+13.324	-22 53 28.8	+30.16	0.170 5913	-521.4	5.68	5.94	1 48.7
22	19 50 1.26	13.279	22 41 4.6	31.86	0.169 3335	526.8	5.70	5.96	1 50.1
23	19 55 19.42	13.234	22 27 59.9	33.53	0.168 0627	532.2	5.72	5.98	1 51.4
24	20 0 36.46	13.186	22 14 15.3	35.18	0.166 7788	537.7	5.72	5.99	1 52.8
25	20 5 52.33	13.137	21 59 51.4	36.81	0.165 4817	543.2	5.74	6.01	1 54.1
26	20 11 7.01	+13.086	-21 44 48.7	+38.41	0.164 1713	-548.8	5.76	6.03	1 55.4
27	20 16 20.47	13.035	21 29 7.8	39.99	0.162 8476	554.4	5.78	6.05	1 56.7
28	20 21 32.67	12.982	21 12 49.4	41.54	0.161 5103	560.0	5.80	6.07	1 57.9
29	20 26 43.60	12.928	20 55 54.2	43.06	0.160 1594	565.7	5.82	6.09	1 59.2
30	20 31 53.23	12.874	20 38 22.7	44.56	0.158 7947	571.5	5.83	6.10	2 0.4
31	20 37 1.55	+12.819	-20 20 15.6	+46.03	0.157 4161	-577.4	5.85	6.12	2 1.6
32	20 42 8.53	....	-20 1 33.7	....	0.156 0232	....	5.87	6.14	2 2.8

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Jan.	0	120 48 8.4	1 37 25.6	+3 1.0	+2 23 37.1	+4 5.5	9.856 4210	-137
	2	124 3 1.4	1 37 27.4	3 0.0	2 31 34.0	3 51.3	9.856 3983	90
	4	127 17 57.7	1 37 28.9	2 56.6	2 39 1.8	3 36.3	9.856 3850	-43
	6	130 32 56.8	1 37 30.1	2 51.0	2 45 58.9	3 20.7	9.856 3810	+4
	8	133 47 58.0	1 37 31.0	2 43.2	2 52 24.1	3 4.4	9.856 3864	50
	10	137 3 0.7	1 37 31.6	+2 33.2	+2 58 16.0	+2 47.4	9.856 4012	+97
	12	140 18 4.3	1 37 31.9	2 21.3	3 3 33.5	2 30.0	9.856 4253	144
	14	143 33 8.2	1 37 31.9	2 7.6	3 8 15.6	2 12.0	9.856 4587	190
	16	146 48 11.7	1 37 31.6	1 52.3	3 12 21.4	1 53.6	9.856 5012	236
	18	150 3 14.2	1 37 30.8	1 35.5	3 15 50.0	1 34.9	9.856 5528	280
	20	153 18 14.8	1 37 29.8	+1 17.5	+3 18 40.9	+1 15.9	9.856 6131	+323
	22	156 33 13.0	1 37 28.4	0 58.5	3 20 53.5	0 56.6	9.856 6820	366
	24	159 48 8.0	1 37 26.6	0 38.7	3 22 27.4	0 37.2	9.856 7594	408
	26	163 2 59.1	1 37 24.4	+0 18.5	3 23 22.3	+0 17.7	9.856 8449	447
	28	166 17 45.6	1 37 22.0	-0 1.9	3 23 38.1	-0 1.9	9.856 9382	486
	30	169 32 26.8	1 37 19.2	-0 22.4	+3 23 14.8	-0 21.4	9.857 0391	+523
Feb.	1	172 47 2.1	1 37 16.1	0 42.5	3 22 12.6	0 40.8	9.857 1472	558
	3	176 1 30.9	1 37 12.7	1 2.1	3 20 31.6	1 0.1	9.857 2622	592
	5	179 15 52.6	1 37 9.0	1 20.9	3 18 12.4	1 19.1	9.857 3837	623
	7	182 30 6.5	1 37 5.0	1 38.6	3 15 15.3	1 37.9	9.857 5113	652
	9	185 44 12.2	1 37 0.7	-1 55.1	+3 11 41.1	-1 56.3	9.857 6446	+680
	11	188 58 9.1	1 36 56.2	2 10.1	3 7 30.4	2 14.3	9.857 7832	705
	13	192 11 56.9	1 36 51.5	2 23.4	3 2 44.3	2 31.8	9.857 9265	728
	15	195 25 35.0	1 36 46.6	2 34.9	2 57 23.6	2 48.8	9.858 0742	749
	17	198 39 3.1	1 36 41.5	2 44.4	2 51 29.4	3 5.2	9.858 2258	767
	19	201 52 21.0	1 36 36.4	-2 51.9	+2 45 3.1	-3 21.0	9.858 3808	+782
	21	205 5 28.4	1 36 31.0	2 57.2	2 38 5.8	3 36.2	9.858 5386	796
	23	208 18 25.0	1 36 25.6	3 0.2	2 30 38.9	3 50.6	9.858 6989	806
	25	211 31 10.8	1 36 20.2	3 1.0	2 22 44.0	4 4.2	9.858 8610	814
	27	214 43 45.7	1 36 14.7	2 59.5	2 14 22.6	4 17.1	9.859 0245	820
Mar.	1	217 56 9.6	1 36 9.2	-2 55.8	+2 5 36.3	-4 29.1	9.859 1889	+823
	3	221 8 22.5	1 36 3.7	2 49.8	1 56 26.9	4 40.2	9.859 3536	824
	5	224 20 24.5	1 35 58.3	2 41.8	1 46 56.1	4 50.4	9.859 5181	822
	7	227 32 15.9	1 35 53.0	2 31.7	1 37 5.8	4 59.7	9.859 6820	817
	9	230 43 56.7	1 35 47.8	2 19.8	1 26 57.8	5 8.1	9.859 8446	810
	11	233 55 27.2	1 35 42.7	-2 6.1	+1 16 34.1	-5 15.4	9.860 0056	+800
	13	237 6 47.6	1 35 37.8	1 50.9	1 5 56.6	5 21.9	9.860 1643	788
	15	240 17 58.4	1 35 33.0	1 34.3	0 55 7.3	5 27.2	9.860 3204	773
	17	243 28 59.9	1 35 28.5	1 16.6	0 44 8.3	5 31.6	9.860 4733	756
	19	246 39 52.4	1 35 24.1	0 57.9	0 33 1.6	5 35.0	9.860 6225	736
	21	249 50 36.4	1 35 20.0	-0 38.6	+0 21 49.2	-5 37.3	9.860 7677	+714
	23	253 1 12.5	1 35 16.1	-0 18.7	+0 10 33.2	5 38.6	9.860 9083	691
	25	256 11 41.0	1 35 12.5	+0 1.3	-0 0 44.3	5 38.8	9.861 0440	665
	27	259 22 2.5	1 35 9.1	0 21.3	0 12 1.2	5 38.0	9.861 1743	637
	29	262 32 17.6	1 35 6.0	0 41.1	0 23 15.5	5 36.2	9.861 2988	608
	31	265 42 26.9	1 35 3.3	+1 0.3	-0 34 25.2	-5 33.4	9.861 4172	+576
Apr.	2	268 52 30.8	1 35 0.7	+1 18.8	-0 45 28.2	-5 29.5	9.861 5291	+543

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Apr.	2	268 52 30.8	1 35 0.7	+1 18.8	-0 45 28.2	-5 29.5	9.861 5291	+543
	4	272 2 30.0	1 34 58.5	1 36.3	0 56 22.5	5 24.7	9.861 6342	508
	6	275 12 25.0	1 34 56.6	1 52.6	1 7 6.3	5 18.9	9.861 7321	471
	8	278 22 16.5	1 34 54.9	2 7.6	1 17 37.4	5 12.1	9.861 8226	434
	10	281 32 4.9	1 34 53.6	2 21.0	1 27 54.2	5 4.4	9.861 9054	394
	12	284 41 51.0	1 34 52.5	+2 32.6	-1 37 54.6	-4 55.8	9.861 9802	+354
	14	287 51 35.2	1 34 51.7	2 42.4	1 47 37.0	4 46.4	9.862 0468	312
	16	291 1 18.0	1 34 51.2	2 50.2	1 56 59.5	4 36.0	9.862 1051	270
	18	294 11 0.2	1 34 51.0	2 56.0	2 6 0.6	4 24.9	9.862 1548	227
	20	297 20 42.0	1 34 51.0	2 59.6	2 14 38.5	4 12.9	9.862 1958	183
	22	300 30 24.2	1 34 51.2	+3 1.0	-2 22 51.8	-4 0.2	9.862 2280	+139
	24	303 40 7.1	1 34 51.7	3 0.2	2 30 39.0	3 46.8	9.862 2513	94
	26	306 49 51.2	1 34 52.4	2 57.2	2 37 58.7	3 32.7	9.862 2656	49
	28	309 59 36.9	1 34 53.4	2 52.1	2 44 49.5	3 18.0	9.862 2709	+ 4
	30	313 9 24.7	1 34 54.5	2 44.9	2 51 10.2	3 2.6	9.862 2672	41
May	2	316 19 15.0	1 34 55.8	+2 35.7	-2 56 59.7	-2 46.7	9.862 2544	86
	4	319 29 8.0	1 34 57.3	2 24.5	3 2 16.8	2 30.4	9.862 2327	131
	6	322 39 4.2	1 34 59.0	2 11.6	3 7 0.8	2 13.5	9.862 2020	176
	8	325 49 3.9	1 35 0.8	1 57.1	3 11 10.5	1 56.2	9.862 1625	220
	10	328 59 7.3	1 35 2.6	1 41.2	3 14 45.4	1 38.6	9.862 1142	263
	12	332 9 14.6	1 35 4.7	+1 24.0	-3 17 44.6	-1 20.6	9.862 0574	-305
	14	335 19 26.3	1 35 6.9	1 5.8	3 20 7.7	1 2.4	9.861 9923	347
	16	338 29 42.3	1 35 9.2	0 46.8	3 21 54.2	0 44.0	9.861 9188	387
	18	341 40 3.0	1 35 11.5	0 27.2	3 23 3.7	0 25.5	9.861 8375	426
	20	344 50 28.5	1 35 14.0	+0 7.2	3 23 35.9	-0 6.8	9.861 7483	465
	22	348 0 59.0	1 35 16.6	-0 12.8	-3 23 30.7	+0 12.0	9.861 6517	-501
	24	351 11 34.7	1 35 19.2	0 32.7	3 22 48.1	0 30.6	9.861 5479	537
	26	354 22 15.6	1 35 21.8	0 52.2	3 21 28.1	0 49.3	9.861 4371	570
	28	357 33 1.8	1 35 24.5	1 11.0	3 19 31.0	1 7.8	9.861 3199	602
	30	0 43 53.6	1 35 27.3	1 29.0	3 16 57.0	1 26.2	9.861 1964	632
June	1	3 54 50.9	1 35 30.0	-1 45.9	-3 13 46.6	+1 44.2	9.861 0671	-660
	3	7 5 53.8	1 35 32.9	2 1.6	3 10 0.2	2 2.1	9.860 9324	687
	5	10 17 2.5	1 35 35.8	2 15.7	3 5 38.5	2 19.6	9.860 7926	711
	7	13 28 17.1	1 35 38.8	2 28.2	3 0 42.3	2 36.6	9.860 6482	733
	9	16 39 37.5	1 35 41.7	2 38.8	2 55 12.4	2 53.2	9.860 4997	752
	11	19 51 4.0	1 35 44.8	-2 47.5	-2 49 9.7	+3 9.4	9.860 3475	-770
	13	23 2 36.6	1 35 47.8	2 54.1	2 42 35.3	3 25.0	9.860 1920	785
	15	26 14 15.2	1 35 50.9	2 58.5	2 35 30.3	3 39.9	9.860 0337	798
	17	29 26 0.2	1 35 54.0	3 0.8	2 27 56.1	3 54.2	9.859 8732	808
	19	32 37 51.4	1 35 57.2	3 0.8	2 19 53.9	4 7.8	9.859 7108	816
	21	35 49 49.0	1 36 0.4	-2 58.5	-2 11 25.3	+4 20.7	9.859 5472	-820
	23	39 1 53.1	1 36 3.7	2 54.0	2 2 31.7	4 32.8	9.859 3828	823
	25	42 14 3.8	1 36 7.0	2 47.3	1 53 14.7	4 44.0	9.859 2181	823
	27	45 26 21.1	1 36 10.4	2 38.6	1 43 36.1	4 54.4	9.859 0537	820
	29	48 38 45.2	1 36 13.7	2 27.8	1 33 37.6	5 3.9	9.858 8901	816
July	1	51 51 16.0	1 36 17.2	-2 15.2	-1 23 21.0	+5 12.5	9.858 7277	-808
	3	55 3 53.8	1 36 20.6	-2 0.9	-1 12 48.3	+5 20.1	9.858 5672	-797

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
July	1	51 51 16.0	1 36 17.2	-2 15.2	-1 23 21.0	+5 12.5	9.858 7277	-808
	3	55 3 53.8	1 36 20.6	2 0.9	1 12 48.3	5 20.1	9.858 5672	797
	5	58 16 38.5	1 36 24.1	1 45.0	1 2 1.4	5 26.6	9.858 4090	785
	7	61 29 30.3	1 36 27.7	1 27.8	0 51 2.4	5 32.2	9.858 2535	770
	9	64 42 29.2	1 36 31.2	1 9.5	0 39 53.2	5 36.8	9.858 1014	752
	11	67 55 35.2	1 36 34.8	-0 50.3	-0 28 36.0	+5 40.2	9.857 9531	-732
	13	71 8 48.3	1 36 38.4	0 30.5	0 17 13.0	5 42.6	9.857 8090	709
	15	74 22 8.7	1 36 42.0	-0 10.2	-0 5 46.2	5 44.0	9.857 6697	684
	17	77 35 36.2	1 36 45.6	+0 10.1	+0 5 42.1	5 44.2	9.857 5356	657
	19	80 49 10.9	1 36 49.1	0 30.4	0 17 9.7	5 43.2	9.857 4070	628
	21	84 2 52.7	1 36 52.6	+0 50.3	+0 28 34.4	+5 41.3	9.857 2845	-596
	23	87 16 41.5	1 36 56.2	1 9.6	0 39 54.1	5 38.2	9.857 1685	561
	25	90 30 37.3	1 36 59.6	1 27.9	0 51 6.6	5 34.0	9.857 0592	529
	27	93 44 39.8	1 37 2.9	1 45.2	1 2 9.6	5 28.8	9.856 9571	492
	29	96 58 48.9	1 37 6.2	2 1.2	1 13 0.9	5 22.4	9.856 8626	454
	31	100 13 4.4	1 37 9.4	+2 15.6	+1 23 38.6	+5 15.1	9.856 7758	-414
Aug.	2	103 27 26.2	1 37 12.4	2 28.2	1 34 0.5	5 6.7	9.856 6971	373
	4	106 41 53.8	1 37 15.2	2 39.0	1 44 4.6	4 57.2	9.856 6268	330
	6	109 56 27.0	1 37 17.9	2 47.8	1 53 48.9	4 46.9	9.856 5650	287
	8	113 11 5.4	1 37 20.4	2 54.4	2 3 11.5	4 35.6	9.856 5121	242
	10	116 25 48.6	1 37 22.8	+2 58.8	+2 12 10.6	+4 23.4	9.856 4681	-197
	12	119 40 36.3	1 37 24.9	3 0.9	2 20 44.3	4 10.2	9.856 4332	151
	14	122 55 27.9	1 37 26.7	3 0.6	2 28 51.0	3 56.3	9.856 4076	105
	16	126 10 23.0	1 37 28.3	2 58.1	2 36 29.1	3 41.6	9.856 3912	58
	18	129 25 21.0	1 37 29.6	2 53.2	2 43 37.1	3 26.2	9.856 3843	-11
	20	132 40 21.3	1 37 30.6	+2 46.1	+2 50 13.5	+3 10.1	9.856 3867	+35
	22	135 55 23.4	1 37 31.1	2 36.9	2 56 17.2	2 53.4	9.856 3984	82
	24	139 10 26.6	1 37 31.8	2 25.7	3 1 46.8	2 36.1	9.856 4195	129
	26	142 25 30.3	1 37 31.8	2 12.6	3 6 41.3	2 18.4	9.856 4499	175
	28	145 40 33.8	1 37 31.6	1 57.8	3 10 59.9	2 0.2	9.856 4895	220
	30	148 55 36.5	1 37 31.0	+1 41.5	+3 14 41.6	+1 41.5	9.856 5381	+265
Sept.	1	152 10 37.6	1 37 30.0	1 23.9	3 17 45.7	1 22.6	9.856 5955	309
	3	155 25 36.5	1 37 28.8	1 5.2	3 20 11.7	1 3.4	9.856 6617	352
	5	158 40 32.4	1 37 27.1	0 45.7	3 21 59.1	0 41.0	9.856 7363	394
	7	161 55 24.6	1 37 25.1	0 25.6	3 23 7.6	0 24.5	9.856 8191	434
	9	165 10 12.5	1 37 22.8	+0 5.2	+3 23 37.1	+0 5.0	9.856 9099	+473
	11	168 24 55.4	1 37 20.1	-0 15.3	3 23 27.4	-0 14.6	9.857 0083	510
	13	171 39 32.6	1 37 17.0	0 35.5	3 22 38.8	0 34.0	9.857 1140	546
	15	174 54 3.4	1 37 13.8	0 55.4	3 21 11.3	0 53.4	9.857 2268	580
	17	178 8 27.4	1 37 10.2	1 14.4	3 19 5.4	1 12.5	9.857 3461	612
	19	181 22 43.8	1 37 6.2	-1 32.5	+3 16 21.4	-1 31.4	9.857 4717	+643
	21	184 36 52.1	1 37 2.0	1 49.5	3 13 0.1	1 49.9	9.857 6031	671
	23	187 50 51.8	1 36 57.6	2 5.0	3 9 2.1	2 8.0	9.857 7399	696
	25	191 4 42.5	1 36 53.0	2 19.0	3 4 28.2	2 25.7	9.857 8816	720
	27	194 18 23.7	1 36 48.2	2 31.1	2 59 19.5	2 42.9	9.858 0278	742
	29	197 31 55.1	1 36 43.2	-2 41.4	+2 53 36.9	-2 59.6	9.858 1781	+761
Oct.	1	200 45 16.3	1 36 38.0	-2 49.5	+2 47 21.6	-3 15.6	9.858 3319	+777

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	° ' "	' "	° ' "	' "		
Oct.	1	200 45 16.3	1 36 38.0	-2 49.5	+2 47 21.6	-3 15.6	9.858 3319	+777
	3	203 58 27.1	1 36 32.8	2 55.6	2 40 35.0	3 30.9	9.858 4888	791
	5	207 11 27.2	1 36 27.4	2 59.4	2 33 18.3	3 45.6	9.858 6482	802
	7	210 24 16.5	1 36 21.9	3 1.0	2 25 33.0	3 59.5	9.858 8096	812
	9	213 36 54.9	1 36 16.5	3 0.3	2 17 20.7	4 12.6	9.858 9726	818
	11	216 49 22.4	1 36 11.0	-2 57.3	+2 8 43.0	-4 25.0	9.859 1367	+822
	13	220 1 38.9	1 36 5.5	2 52.1	1 59 41.5	4 36.4	9.859 3012	823
	15	223 13 44.5	1 36 0.1	2 44.8	1 50 17.9	4 47.0	9.859 4658	822
	17	226 25 39.3	1 35 54.7	2 35.4	1 40 34.3	4 56.6	9.859 6298	818
	19	229 37 23.5	1 35 49.5	2 24.1	1 30 32.2	5 5.3	9.859 7929	812
	21	232 48 57.4	1 35 44.4	-2 11.1	+1 20 13.8	-5 13.0	9.859 9544	+803
	23	236 0 21.1	1 35 39.4	1 56.4	1 9 40.9	5 19.8	9.860 1138	792
	25	239 11 35.0	1 35 34.6	1 40.2	0 58 55.5	5 25.5	9.860 2708	778
	27	242 22 39.5	1 35 30.0	1 22.9	0 47 59.7	5 30.2	9.860 4247	762
	29	245 33 34.9	1 35 25.5	1 4.5	0 36 55.4	5 33.9	9.860 5752	743
	31	248 44 21.6	1 35 21.3	-0 45.4	+0 25 44.8	-5 36.6	9.860 7217	+722
Nov.	2	251 55 0.2	1 35 17.4	0 25.7	0 14 29.8	5 38.2	9.860 8638	699
	4	255 5 31.2	1 35 13.6	-0 5.7	+0 3 12.7	5 38.8	9.861 0012	674
	6	258 15 55.0	1 35 10.2	+0 14.4	-0 8 4.7	5 38.4	9.861 1333	647
	8	261 26 12.1	1 35 7.0	0 34.2	0 19 20.1	5 36.9	9.861 2598	618
	10	264 36 23.2	1 35 4.1	+0 53.6	-0 30 31.6	-5 34.4	9.861 3803	+587
	12	267 46 28.7	1 35 1.5	1 12.4	0 41 37.2	5 31.0	9.861 4944	554
	14	270 56 29.3	1 34 59.2	1 30.3	0 52 34.8	5 26.5	9.861 6018	520
	16	274 6 25.6	1 34 57.2	1 47.0	1 3 22.5	5 21.0	9.861 7022	484
	18	277 16 18.1	1 34 55.4	2 2.5	1 13 58.2	5 14.6	9.861 7952	446
	20	280 26 7.3	1 34 53.9	+2 16.4	-1 24 20.2	-5 7.2	9.861 8806	+408
Dec.	22	283 35 54.0	1 34 52.8	2 28.7	1 34 26.6	4 59.0	9.861 9581	368
	24	286 45 38.7	1 34 51.9	2 39.2	1 44 15.4	4 49.8	9.862 0276	327
	26	289 55 21.8	1 34 51.3	2 47.7	1 53 45.1	4 39.8	9.862 0887	285
	28	293 5 4.0	1 34 51.0	2 54.2	2 2 53.9	4 28.9	9.862 1414	242
	30	296 14 45.8	1 34 50.9	+2 58.6	-2 11 40.1	-4 17.2	9.862 1854	+198
	2	299 24 27.7	1 34 51.0	3 0.7	2 20 2.2	4 4.8	9.862 2206	154
	4	302 34 10.2	1 34 51.4	3 0.7	2 27 58.7	3 51.6	9.862 2470	109
	6	305 43 53.7	1 34 52.1	2 58.5	2 35 28.1	3 37.7	9.862 2643	64
	8	308 53 38.7	1 34 53.0	2 54.1	2 42 29.2	3 23.2	9.862 2727	+ 19
	10	312 3 25.6	1 34 54.0	+2 47.6	-2 49 0.5	-3 8.1	9.862 2720	- 26
	12	315 13 14.9	1 34 55.3	2 39.1	2 55 1.1	2 52.4	9.862 2623	71
	14	318 23 6.8	1 34 56.7	2 28.6	3 0 29.7	2 36.1	9.862 2436	116
	16	321 33 1.7	1 34 58.3	2 16.3	3 5 25.3	2 19.4	9.862 2160	160
	18	324 43 0.0	1 35 0.0	2 2.3	3 9 47.1	2 2.3	9.862 1794	205
	20	327 53 2.0	1 35 1.9	+1 46.9	-3 13 34.3	-1 44.8	9.862 1341	-248
	22	331 3 7.8	1 35 3.9	1 30.1	3 16 46.1	1 26.9	9.862 0802	291
	24	334 13 17.8	1 35 6.1	1 12.2	3 19 21.9	1 8.8	9.862 0178	333
	26	337 23 32.2	1 35 8.3	0 53.5	3 21 21.2	0 50.5	9.861 9471	374
	28	340 33 51.2	1 35 10.7	0 34.1	3 22 43.7	0 31.9	9.861 8683	414
	30	343 44 14.9	1 35 13.1	+0 14.2	-3 23 28.9	-0 13.3	9.861 7817	-452
	32	346 54 43.6	1 35 15.6	-0 5.8	-3 23 36.9	+0 5.3	9.861 6875	- 10

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
Jan.	1	23	7	20.75	+6.742	-6	25	38.4	+45.40	0.181 6610	+875.2	3.08	5.79	4 26.7
	2	23	10	2.47	6.734	6	7	27.7	45.49	0.183 7576	872.0	3.06	5.76	4 25.4
	3	23	12	44.00	6.726	5	49	14.9	45.57	0.185 8466	868.9	3.05	5.74	4 24.2
	4	23	15	25.34	6.718	5	31	0.2	45.65	0.187 9282	865.8	3.04	5.71	4 22.9
	5	23	18	6.49	6.711	5	12	43.7	45.72	0.190 0026	862.8	3.02	5.68	4 21.7
	6	23	20	47.47	+6.704	-4	54	25.6	+45.78	0.192 0695	+859.7	3.01	5.65	4 20.4
	7	23	23	28.28	6.697	4	36	6.1	45.84	0.194 1290	856.6	3.00	5.63	4 19.1
	8	23	26	8.94	6.691	4	17	45.2	45.89	0.196 1812	853.5	2.98	5.60	4 17.9
	9	23	28	49.45	6.685	3	59	23.2	45.94	0.198 2260	850.4	2.97	5.58	4 16.6
	10	23	31	29.82	6.679	3	41	0.1	45.98	0.200 2634	847.3	2.95	5.55	4 15.3
	11	23	34	10.06	+6.674	-3	22	36.2	+46.01	0.202 2932	+844.2	2.94	5.52	4 14.1
	12	23	36	50.19	6.670	3	4	11.6	46.04	0.204 3154	841.0	2.93	5.50	4 12.8
	13	23	39	30.20	6.665	2	45	46.5	46.06	0.206 3299	837.8	2.91	5.47	4 11.5
	14	23	42	10.10	6.660	2	27	21.0	46.07	0.208 3366	834.5	2.90	5.45	4 10.2
	15	23	44	49.89	6.656	2	8	55.2	46.08	0.210 3354	831.2	2.88	5.42	4 8.9
	16	23	47	29.60	+6.653	-1	50	29.4	+46.08	0.212 3261	+827.8	2.87	5.40	4 7.7
	17	23	50	9.22	6.649	1	32	3.6	46.07	0.214 3086	824.3	2.86	5.37	4 6.4
	18	23	52	48.75	6.645	1	13	38.1	46.05	0.216 2829	820.9	2.85	5.35	4 5.1
	19	23	55	28.20	6.642	0	55	13.1	46.03	0.218 2489	817.4	2.83	5.32	4 3.8
	20	23	58	7.57	6.639	0	36	48.6	46.01	0.220 2064	813.9	2.82	5.30	4 2.5
	21	0	0	46.87	+6.636	-0	18	24.9	+45.97	0.222 1555	+810.3	2.81	5.28	4 1.2
	22	0	3	26.11	6.633	-0	0	2.1	45.93	0.224 0960	806.8	2.79	5.25	4 0.0
	23	0	6	5.28	6.631	+0	18	19.6	45.88	0.226 0282	803.3	2.78	5.23	3 58.7
	24	0	8	44.40	6.629	0	36	40.2	45.83	0.227 9517	799.7	2.77	5.21	3 57.4
	25	0	11	23.47	6.627	0	54	59.3	45.76	0.229 8667	796.1	2.76	5.18	3 56.1
	26	0	14	2.48	+6.625	+1	13	16.8	+45.69	0.231 7732	+792.6	2.75	5.16	3 54.8
	27	0	16	41.46	6.623	1	31	32.6	45.62	0.233 6712	789.1	2.73	5.14	3 53.5
	28	0	19	20.39	6.622	1	49	46.5	45.54	0.235 5607	785.5	2.72	5.12	3 52.2
	29	0	21	59.30	6.620	2	7	58.4	45.45	0.237 4417	782.0	2.71	5.09	3 50.9
	30	0	24	38.17	6.619	2	26	8.0	45.35	0.239 3142	778.5	2.70	5.07	3 49.6
	31	0	27	17.02	+6.618	+2	44	15.3	+45.26	0.241 1785	+775.1	2.69	5.05	3 48.3
Feb.	1	0	29	55.86	6.618	3	2	20.2	45.15	0.243 0345	771.6	2.68	5.03	3 47.0
	2	0	32	34.69	6.618	3	20	22.4	45.04	0.244 8824	768.2	2.67	5.01	3 45.8
	3	0	35	13.53	6.619	3	38	21.9	44.92	0.246 7220	764.8	2.65	4.99	3 44.5
	4	0	37	52.38	6.619	3	56	18.5	44.79	0.248 5535	761.4	2.64	4.96	3 43.2
	5	0	40	31.25	+6.620	+4	14	12.0	+44.67	0.250 3769	+758.0	2.63	4.94	3 41.9
	6	0	43	10.15	6.622	4	32	2.4	44.53	0.252 1921	754.6	2.62	4.92	3 40.6
	7	0	45	49.09	6.623	4	49	49.4	44.39	0.253 9992	751.2	2.61	4.90	3 39.3
	8	0	48	28.07	6.625	5	7	33.1	44.25	0.255 7980	747.8	2.60	4.88	3 38.0
	9	0	51	7.11	6.628	5	25	13.2	44.09	0.257 5884	744.3	2.59	4.86	3 36.7
	10	0	53	46.21	+6.631	+5	42	49.6	+43.94	0.259 3705	+740.8	2.57	4.84	3 35.4
	11	0	56	25.38	6.634	6	0	22.2	43.78	0.261 1440	737.2	2.56	4.82	3 34.1
	12	0	59	4.63	6.637	6	17	50.9	43.61	0.262 9091	733.6	2.55	4.80	3 32.9
	13	1	1	43.96	6.641	6	35	15.4	43.43	0.264 6654	730.0	2.54	4.78	3 31.6
	14	1	4	23.38	6.644	6	52	35.7	43.26	0.266 4129	726.3	2.54	4.77	3 30.3
	15	1	7	2.89	+6.648	+7	9	51.7	+43.07	0.268 1515	+722.5	2.53	4.75	3 29.0
	16	1	9	42.50	+6.653	+7	27	3.2	+42.88	0.269 8811	+718.8	2.52	4.73	3 27.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Feb.	16	1	9 42.50	+6.653	+	7	27 3.2	+42.88	0.269 8811	+718.8	2.52	4.73	3 27.7
	17	1	12 22.22	6.657		7	44 10.0	42.68	0.271 6017	715.0	2.51	4.71	3 26.4
	18	1	15 2.04	6.662		8	1 11.9	42.48	0.273 3133	711.3	2.50	4.69	3 25.1
	19	1	17 41.99	6.666		8	18 9.0	42.28	0.275 0157	707.4	2.48	4.67	3 23.9
	20	1	20 22.03	6.671		8	35 1.1	42.06	0.276 7089	703.6	2.47	4.65	3 22.6
	21	1	23 2.19	+6.676	+	8	51 47.9	+41.84	0.278 3929	+699.7	2.47	4.64	3 21.3
	22	1	25 42.47	6.681		9	8 29.4	41.61	0.280 0677	696.0	2.46	4.62	3 20.1
	23	1	28 22.88	6.686		9	25 5.3	41.38	0.281 7335	692.1	2.45	4.60	3 18.8
	24	1	31 3.42	6.692		9	41 35.7	41.14	0.283 3899	688.3	2.44	4.58	3 17.5
	25	1	33 44.08	6.697		9	58 0.2	40.90	0.285 0372	684.4	2.43	4.57	3 16.3
Mar.	26	1	36 24.88	+6.703	+10	14 18.9	+40.65	0.286 6752	+680.6	2.42	4.55	3 15.0	
	27	1	39 5.82	6.709		10	30 31.5	40.40	0.288 3043	676.9	2.41	4.53	3 13.8
	28	1	41 46.90	6.715		10	46 38.0	40.14	0.289 9242	673.1	2.40	4.51	3 12.5
	1	1	44 28.13	6.721		11	2 38.2	39.88	0.291 5352	669.1	2.39	4.50	3 11.3
	2	1	47 9.51	6.727		11	18 32.0	39.61	0.293 1374	665.7	2.38	4.48	3 10.0
	3	1	49 51.04	+6.734	+11	34 19.2	+39.33	0.294 7305	+662.0	2.37	4.46	3 8.7	
	4	1	52 32.74	6.741		11	49 59.8	39.05	0.296 3149	658.3	2.37	4.45	3 7.5
	5	1	55 14.61	6.748		12	5 33.6	38.77	0.297 8905	654.7	2.36	4.43	3 6.2
	6	1	57 56.65	6.756		12	21 0.5	38.48	0.299 4574	651.0	2.35	4.42	3 5.0
	7	2	0 38.88	6.764		12	36 20.5	38.19	0.301 0153	647.3	2.34	4.40	3 3.8
	8	2	3 21.30	+6.772	+12	51 33.4	+37.89	0.302 5644	+643.6	2.33	4.38	3 2.5	
	9	2	6 3.91	6.780		13	6 39.0	37.58	0.304 1047	639.9	2.32	4.37	3 1.3
	10	2	8 46.72	6.788		13	21 37.3	37.28	0.305 6360	636.2	2.31	4.35	3 0.1
	11	2	11 29.74	6.797		13	36 28.2	36.97	0.307 1583	632.4	2.31	4.34	2 58.8
	12	2	14 12.97	6.805		13	51 11.6	36.65	0.308 6716	628.6	2.30	4.32	2 57.6
	13	2	16 56.40	+6.814	+14	5 47.3	+36.33	0.310 1756	+624.8	2.29	4.31	2 56.4	
	14	2	19 40.05	6.823		14	20 15.2	36.00	0.311 6704	620.9	2.28	4.29	2 55.2
	15	2	22 23.92	6.832		14	34 35.2	35.67	0.313 1558	617.0	2.28	4.28	2 54.0
	16	2	25 8.00	6.841		14	48 47.3	35.33	0.314 6320	613.1	2.27	4.26	2 52.8
	17	2	27 52.30	6.850		15	2 51.2	34.99	0.316 0986	609.1	2.26	4.25	2 51.6
	18	2	30 36.82	+6.860	+15	16 46.9	+34.64	0.317 5557	+605.1	2.26	4.24	2 50.4	
	19	2	33 21.57	6.869		15	30 34.1	34.29	0.319 0032	601.1	2.25	4.22	2 49.2
	20	2	36 6.53	6.878		15	44 13.0	33.94	0.320 4412	597.1	2.24	4.21	2 48.0
	21	2	38 51.72	6.887		15	57 43.3	33.58	0.321 8695	593.1	2.23	4.19	2 46.8
	22	2	41 37.13	6.896		16	11 4.9	33.22	0.323 2882	589.1	2.22	4.18	2 45.6
	23	2	44 22.75	+6.906	+16	24 17.8	+32.85	0.324 6974	+585.1	2.22	4.17	2 44.4	
	24	2	47 8.60	6.915		16	37 21.7	32.48	0.326 0968	581.1	2.21	4.15	2 43.3
	25	2	49 54.67	6.924		16	50 16.6	32.10	0.327 4866	577.1	2.20	4.14	2 42.1
26	2	52 40.96	6.933		17	3 2.4	31.72	0.328 8668	573.1	2.20	4.13	2 40.9	
27	2	55 27.46	6.942		17	15 38.9	31.33	0.330 2376	569.1	2.19	4.11	2 39.8	
28	2	58 14.18	+6.951	+17	28 6.1	+30.94	0.331 5987	+565.2	2.18	4.10	2 38.6		
29	3	1 1.12	6.960		17	40 23.8	30.54	0.332 9504	561.3	2.18	4.09	2 37.4	
30	3	3 48.28	6.969		17	52 32.0	30.14	0.334 2928	557.4	2.17	4.08	2 36.3	
31	3	6 35.65	6.978		18	4 30.5	29.74	0.335 6258	553.5	2.16	4.06	2 35.1	
Apr.	1	3	9 23.23	6.987		18	16 19.3	29.33	0.336 9497	549.7	2.15	4.05	2 34.0
	2	3	12 11.04	+6.997	+18	27 53.2	+28.91	0.338 2643	+545.8	2.15	4.04	2 32.8	
	3	3	14 59.07	+7.006	+18	39 27.2	+28.50	0.339 5697	+542.0	2.14	4.03	2 31.7	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Apr.	1	3	9 23.23	+6.987	+18	16	19.3	+29.33	0.336 9497	+549.7	2.15	4.05	2 34.0
	2	3	12 11.04	6.997	18	27	58.2	28.91	0.338 2643	545.8	2.15	4.04	2 32.8
	3	3	14 59.07	7.006	18	39	27.2	28.50	0.339 5697	542.0	2.14	4.03	2 31.7
	4	3	17 47.31	7.015	18	50	46.3	28.08	0.340 8659	538.2	2.13	4.01	2 30.6
	5	3	20 35.79	7.024	19	1	55.2	27.66	0.342 1529	534.3	2.13	4.00	2 29.4
	6	3	23 24.48	+7.033	+19	12	54.0	+27.23	0.343 4306	+530.5	2.12	3.99	2 28.3
	7	3	26 13.40	7.043	19	23	42.4	26.81	0.344 6992	526.7	2.12	3.98	2 27.1
	8	3	29 2.55	7.052	19	34	20.7	26.38	0.345 9585	522.8	2.11	3.97	2 26.0
	9	3	31 51.91	7.061	19	44	48.5	25.94	0.347 2084	518.8	2.11	3.96	2 24.9
	10	3	34 41.50	7.071	19	55	5.8	25.50	0.348 4489	511.9	2.10	3.95	2 23.8
	11	3	37 31.31	+7.080	+20	5	12.6	+25.06	0.349 6800	+511.0	2.09	3.93	2 22.7
	12	3	40 21.34	7.089	20	15	8.8	21.62	0.350 9016	507.0	2.09	3.92	2 21.6
	13	3	43 11.58	7.098	20	24	54.2	24.17	0.352 1135	502.9	2.08	3.91	2 20.5
	14	3	46 2.04	7.107	20	34	28.9	23.72	0.353 3157	498.9	2.07	3.90	2 19.4
	15	3	48 52.70	7.115	20	43	52.7	23.26	0.354 5082	491.8	2.07	3.89	2 18.3
	16	3	51 43.56	+7.123	+20	53	5.5	+22.80	0.355 6909	+490.8	2.06	3.88	2 17.2
	17	3	54 34.62	7.131	21	2	7.3	22.34	0.356 8639	186.7	2.06	3.87	2 16.1
	18	3	57 25.87	7.139	21	10	57.9	21.88	0.358 0270	482.6	2.05	3.86	2 15.0
	19	4	0 17.31	7.147	21	19	37.4	21.11	0.359 1803	478.5	2.05	3.85	2 13.9
	20	4	3 8.93	7.154	21	28	5.7	20.91	0.360 3238	474.4	2.04	3.84	2 12.9
	21	4	6 0.71	+7.161	+21	36	22.6	+20.47	0.361 4574	+470.3	2.04	3.83	2 11.8
	22	4	8 52.67	7.168	21	44	28.2	19.99	0.362 5812	466.2	2.03	3.82	2 10.7
	23	4	11 44.79	7.175	21	52	22.3	19.51	0.363 6952	462.1	2.03	3.81	2 9.6
	24	4	14 37.07	7.181	22	0	4.9	19.04	0.364 7994	458.0	2.02	3.80	2 8.6
	25	4	17 29.49	7.187	22	7	36.0	18.55	0.365 8938	454.0	2.02	3.79	2 7.5
	26	4	20 22.06	+7.193	+22	14	55.4	+18.07	0.366 9785	+450.0	2.01	3.78	2 6.4
	27	4	23 14.76	7.199	22	22	3.2	17.58	0.368 0536	446.0	2.01	3.77	2 5.4
	28	4	26 7.60	7.204	22	28	59.2	17.09	0.369 1193	442.0	2.00	3.76	2 4.3
	29	4	29 0.55	7.209	22	35	43.5	16.60	0.370 1754	438.1	2.00	3.75	2 3.2
	30	4	31 53.63	7.214	22	42	15.9	16.10	0.371 2220	434.1	1.99	3.74	2 2.2
May	1	4	34 46.83	+7.219	+22	48	36.5	+15.61	0.372 2593	+430.3	1.98	3.73	2 1.1
	2	4	37 40.14	7.224	22	54	45.1	15.11	0.373 2873	426.4	1.98	3.73	2 0.1
	3	4	40 33.56	7.228	23	0	41.8	14.61	0.374 3058	422.4	1.98	3.72	1 59.0
	4	4	43 27.09	7.233	23	6	26.5	14.11	0.375 3149	418.5	1.97	3.71	1 58.0
	5	4	46 20.72	7.237	23	11	59.2	13.61	0.376 3147	414.6	1.97	3.70	1 56.9
	6	4	49 14.45	+7.240	+23	17	19.9	+13.11	0.377 3051	+410.7	1.96	3.69	1 55.9
	7	4	52 8.26	7.244	23	22	28.4	12.60	0.378 2860	406.7	1.96	3.68	1 54.8
	8	4	55 2.16	7.247	23	27	24.8	12.10	0.379 2574	402.8	1.95	3.67	1 53.8
	9	4	57 56.13	7.250	23	32	9.2	11.60	0.380 2193	398.8	1.95	3.67	1 52.8
	10	5	0 50.18	7.253	23	36	41.5	11.09	0.381 1714	394.7	1.95	3.66	1 51.7
	11	5	3 44.29	+7.256	+23	41	1.5	+10.58	0.382 1139	+390.7	1.94	3.65	1 50.7
	12	5	6 38.45	7.258	23	45	9.4	10.08	0.383 0466	386.6	1.94	3.64	1 49.6
	13	5	9 32.66	7.260	23	49	5.1	9.57	0.383 9695	382.5	1.93	3.63	1 48.6
	14	5	12 26.92	7.261	23	52	48.6	9.06	0.384 8827	378.4	1.93	3.63	1 47.6
	15	5	15 21.20	7.262	23	56	19.8	8.54	0.385 7858	374.2	1.93	3.62	1 46.5
	16	5	18 15.50	+7.263	+23	59	38.7	+ 8.03	0.386 6791	+370.1	1.92	3.61	1 45.5
	17	5	21 9.81	+7.263	+24	2	45.4	+ 7.52	0.387 5625	+366.0	1.92	3.60	1 44.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
May	17	5	21	9.81	+7.263	+24	2	45.4	+ 7.52	0.387 5625	+366.0	1.92	3.60	1 44.4
	18	5	24	4.13	7.263	24	5	39.8	7.01	0.388 4359	361.9	1.92	3.60	1 43.4
	19	5	26	58.44	7.263	24	8	21.9	6.50	0.389 2995	357.7	1.91	3.59	1 42.4
	20	5	29	52.73	7.262	24	10	51.8	5.99	0.390 1530	353.6	1.90	3.58	1 41.3
	21	5	32	47.00	7.260	24	13	9.4	5.48	0.390 9966	349.4	1.90	3.58	1 40.3
	22	5	35	41.22	+7.258	+24	15	14.7	+ 4.96	0.391 8303	+345.3	1.90	3.57	1 39.3
	23	5	38	35.40	7.256	24	17	7.7	4.45	0.392 6542	341.2	1.89	3.56	1 38.2
	24	5	41	29.53	7.254	24	18	48.4	3.94	0.393 4683	337.1	1.89	3.56	1 37.2
	25	5	44	23.59	7.251	24	20	16.9	3.43	0.394 2725	333.0	1.89	3.55	1 36.1
	26	5	47	17.58	7.248	24	21	33.2	2.92	0.395 0669	329.0	1.88	3.54	1 35.1
	27	5	50	11.48	+7.244	+24	22	37.2	+ 2.41	0.395 8518	+325.0	1.88	3.54	1 34.1
June	28	5	53	5.30	7.240	24	23	29.0	1.90	0.396 6270	321.0	1.88	3.53	1 33.0
	29	5	55	59.02	7.236	24	24	8.6	1.40	0.397 3928	317.1	1.87	3.52	1 32.0
	30	5	58	52.64	7.232	24	24	36.1	0.89	0.398 1490	313.1	1.87	3.52	1 30.9
	31	6	1	46.14	7.227	24	24	51.3	+ 0.38	0.398 8956	309.1	1.87	3.51	1 29.9
	1	6	4	39.53	+7.222	+24	24	54.4	- 0.12	0.399 6328	+305.2	1.87	3.51	1 28.8
	2	6	7	32.81	7.217	24	24	45.4	0.63	0.400 3605	301.2	1.86	3.50	1 27.8
	3	6	10	25.96	7.212	24	24	24.3	1.13	0.401 0787	297.3	1.86	3.49	1 26.7
	4	6	13	18.99	7.207	24	23	51.1	1.63	0.401 7873	293.3	1.86	3.49	1 25.6
	5	6	16	11.87	7.201	24	23	5.9	2.13	0.402 4864	289.2	1.85	3.48	1 24.6
	6	6	19	4.61	+7.195	+24	22	8.7	- 2.63	0.403 1756	+285.1	1.85	3.48	1 23.5
	7	6	21	57.21	7.188	24	20	59.6	3.13	0.403 8551	281.1	1.85	3.47	1 22.5
July	8	6	24	49.64	7.181	24	19	38.6	3.62	0.404 5248	277.0	1.85	3.47	1 21.4
	9	6	27	41.90	7.174	24	18	5.8	4.11	0.405 1848	272.9	1.84	3.46	1 20.3
	10	6	30	33.99	7.166	24	16	21.2	4.60	0.405 8349	268.8	1.84	3.46	1 19.2
	11	6	33	25.89	+7.159	+24	14	24.8	- 5.09	0.406 4752	+264.7	1.84	3.45	1 18.2
	12	6	36	17.61	7.151	24	12	16.7	5.58	0.407 1054	260.5	1.84	3.45	1 17.1
	13	6	39	9.12	7.142	24	9	56.9	6.07	0.407 7258	256.4	1.83	3.44	1 16.0
	14	6	42	0.43	7.133	24	7	25.5	6.55	0.408 3360	252.2	1.83	3.44	1 14.9
	15	6	44	51.52	7.124	24	4	42.5	7.03	0.408 9362	248.0	1.82	3.43	1 13.8
	16	6	47	42.38	+7.115	+24	1	48.0	- 7.51	0.409 5263	+243.8	1.82	3.43	1 12.7
	17	6	50	33.02	7.105	23	58	42.2	7.98	0.410 1063	239.5	1.82	3.42	1 11.6
	18	6	53	23.42	7.095	23	55	25.0	8.45	0.410 6761	235.3	1.82	3.42	1 10.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	7 29	53.67	+6.940	+22 55	55.0	-14.35	0.417 1816	+182.0	1.79	3.37	3.37	0 55.8
	2	7 32	40.08	6.927	22 50	5.4	14.78	0.417 6135	177.9	1.79	3.36	3.36	0 54.6
	3	7 35	26.18	6.914	22 44	5.5	15.21	0.418 0357	173.9	1.79	3.36	3.36	0 53.5
	4	7 38	11.97	6.901	22 37	55.4	15.63	0.418 4481	169.8	1.79	3.36	3.36	0 52.3
	5	7 40	57.44	6.888	22 31	35.1	16.06	0.418 8506	165.7	1.78	3.35	3.35	0 51.1
	6	7 43	42.58	+6.874	+22 25	4.7	-16.48	0.419 2432	+161.5	1.78	3.35	3.35	0 49.9
	7	7 46	27.41	6.861	22 18	24.3	16.89	0.419 6257	157.3	1.78	3.35	3.35	0 48.7
	8	7 49	11.91	6.847	22 11	34.0	17.30	0.419 9982	153.1	1.78	3.35	3.35	0 47.5
	9	7 51	56.08	6.834	22 4	33.8	17.71	0.420 3607	148.9	1.78	3.34	3.34	0 46.3
	10	7 54	39.92	6.820	21 57	23.9	18.11	0.420 7129	144.6	1.78	3.34	3.34	0 45.1
	11	7 57	23.42	+6.806	+21 50	4.4	-18.51	0.421 0549	+140.4	1.78	3.34	3.34	0 43.9
	12	8 0	6.59	6.792	21 42	35.3	18.91	0.421 3866	136.1	1.77	3.33	3.33	0 42.6
	13	8 2	49.41	6.777	21 34	56.7	19.30	0.421 7080	131.8	1.77	3.33	3.33	0 41.4
	14	8 5	31.88	6.762	21 27	8.8	19.69	0.422 0191	127.5	1.77	3.33	3.33	0 40.2
	15	8 8	14.01	6.748	21 19	11.6	20.08	0.422 3198	123.1	1.77	3.33	3.33	0 38.9
	16	8 10	55.79	+6.733	+21 11	5.2	-20.15	0.422 6101	+118.8	1.77	3.33	3.33	0 37.7
	17	8 13	37.21	6.718	21 2	49.8	20.83	0.422 8901	114.5	1.77	3.32	3.32	0 36.5
	18	8 16	18.27	6.703	20 54	25.3	21.21	0.423 1597	110.2	1.77	3.32	3.32	0 35.2
	19	8 18	58.96	6.688	20 45	51.9	21.57	0.423 4190	105.9	1.77	3.32	3.32	0 33.9
	20	8 21	39.29	6.673	20 37	9.8	21.94	0.423 6679	101.6	1.77	3.32	3.32	0 32.7
	21	8 24	19.26	+6.658	+20 28	18.9	-22.30	0.423 9065	+ 97.3	1.77	3.32	3.32	0 31.4
	22	8 26	58.86	6.642	20 19	19.5	22.65	0.424 1349	93.0	1.76	3.31	3.31	0 30.1
	23	8 29	38.09	6.627	20 10	11.5	23.01	0.424 3531	88.8	1.76	3.31	3.31	0 28.8
	24	8 32	16.96	6.612	20 0	55.1	23.36	0.424 5613	84.6	1.76	3.31	3.31	0 27.5
	25	8 34	55.47	6.597	19 51	30.4	23.70	0.424 7594	80.4	1.76	3.31	3.31	0 26.2
	26	8 37	33.61	+6.582	+19 41	57.5	-24.04	0.424 9474	+ 76.2	1.76	3.31	3.31	0 24.9
	27	8 40	11.39	6.567	19 32	16.4	24.38	0.425 1254	72.1	1.76	3.31	3.31	0 23.6
	28	8 42	48.81	6.552	19 22	27.3	24.72	0.425 2934	67.9	1.76	3.31	3.31	0 22.3
	29	8 45	25.86	6.537	19 12	30.1	25.04	0.425 4512	63.6	1.76	3.30	3.30	0 21.0
	30	8 48	2.57	6.522	19 2	25.2	25.37	0.425 5989	59.4	1.76	3.30	3.30	0 19.6
	31	8 50	38.93	+6.508	+18 52	12.4	-25.69	0.425 7364	+ 55.2	1.76	3.30	3.30	0 18.3
Aug.	1	8 53	14.94	6.493	18 41	52.0	26.01	0.425 8638	50.9	1.76	3.30	3.30	0 17.0
	2	8 55	50.61	6.479	18 31	24.0	26.32	0.425 9809	46.6	1.76	3.30	3.30	0 15.6
	3	8 58	25.93	6.464	18 20	48.5	26.63	0.426 0877	42.3	1.76	3.30	3.30	0 14.3
	4	9 1	0.90	6.450	18 10	5.6	26.94	0.426 1841	38.0	1.76	3.30	3.30	0 12.9
	5	9 3	35.53	+6.436	+17 59	15.4	-27.21	0.426 2700	+ 33.6	1.76	3.30	3.30	0 11.5
	6	9 6	9.83	6.422	17 48	18.0	27.54	0.426 3455	29.3	1.76	3.30	3.30	0 10.2
	7	9 8	43.78	6.408	17 37	13.6	27.83	0.426 4104	24.8	1.76	3.30	3.30	0 8.8
	8	9 11	17.40	6.394	17 26	2.2	28.12	0.426 4647	20.4	1.76	3.30	3.30	0 7.4
	9	9 13	50.69	6.380	17 14	43.9	28.40	0.426 5084	16.0	1.76	3.30	3.30	0 6.0
	10	9 16	23.64	+6.366	+17 3	18.8	-28.69	0.426 5414	+ 11.5	1.76	3.30	3.30	0 4.6
	11	9 18	56.26	6.352	16 51	47.0	28.96	0.426 5636	7.0	1.76	3.30	3.30	0 3.2
	12	9 21	28.54	6.338	16 40	8.7	29.23	0.426 5750	+ 2.5	1.76	3.30	3.30	0 1.8
	13	9 24	0.50	6.325	16 28	23.9	29.50	0.426 5756	- 2.0	1.76	3.30	3.30	0 0.4
	14	9 26	32.13	6.311	16 16	32.7	29.77	0.426 5652	6.6	1.76	3.30	3.30	23 57.6
	15	9 29	3.43	+6.297	+16 4	35.2	-30.02	0.426 5440	- 11.1	1.76	3.30	3.30	23 56.1
	16	9 31	34.41	+6.281	+15 52	31.6	-30.27	0.426 5120	- 15.6	1.76	3.30	3.30	23 54.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Aug. 16	9 31 34.41	+6.284	+15 52 31.6	-30.27	0.426 5120	- 15.6	1.76	3.30	23 54.7
17	9 34 5.06	6.270	15 40 22.0	30.53	0.426 4692	20.1	1.76	3.30	23 53.3
18	9 36 35.39	6.257	15 28 6.3	30.77	0.426 4156	24.6	1.76	3.30	23 51.8
19	9 39 5.40	6.244	15 15 44.9	31.01	0.426 3512	29.0	1.76	3.30	23 50.4
20	9 41 35.09	6.231	15 3 17.6	31.25	0.426 2762	33.4	1.76	3.30	23 48.9
21	9 44 4.47	+6.218	+14 50 44.8	-31.49	0.426 1906	- 38.0	1.76	3.30	23 47.5
22	9 46 33.54	6.205	14 38 6.3	31.72	0.426 0940	42.4	1.76	3.30	23 46.0
23	9 49 2.31	6.192	14 25 22.3	31.95	0.425 9870	46.8	1.76	3.30	23 44.6
24	9 51 30.78	6.180	14 12 32.9	32.17	0.425 8693	51.3	1.76	3.30	23 43.1
25	9 53 58.96	6.168	13 59 38.2	32.39	0.425 7410	55.7	1.76	3.30	23 41.6
26	9 56 26.85	+6.156	+13 46 38.3	-32.60	0.425 6021	- 60.1	1.76	3.30	23 40.1
27	9 58 54.46	6.145	13 33 33.3	32.81	0.425 4525	64.6	1.76	3.30	23 38.6
28	10 1 21.80	6.134	13 20 23.3	33.02	0.425 2922	69.0	1.76	3.31	23 37.1
29	10 3 48.87	6.123	13 7 8.3	33.23	0.425 1212	73.5	1.76	3.31	23 35.6
30	10 6 15.68	6.112	12 53 48.5	33.42	0.424 9394	78.0	1.76	3.31	23 34.1
31	10 8 42.23	+6.101	+12 40 24.0	-33.62	0.424 7468	- 82.5	1.76	3.31	23 32.6
Sept. 1	10 11 8.53	6.091	12 26 54.8	33.81	0.424 5432	87.1	1.76	3.31	23 31.1
2	10 13 34.58	6.080	12 13 21.1	34.00	0.424 3286	91.7	1.76	3.31	23 29.6
3	10 16 0.39	6.070	11 59 42.8	34.18	0.424 1030	96.3	1.76	3.31	23 28.1
4	10 18 25.95	6.060	11 46 0.3	34.36	0.423 8662	101.0	1.77	3.32	23 26.6
5	10 20 51.29	+6.051	+11 32 13.4	-34.54	0.423 6182	-105.7	1.77	3.32	23 25.1
6	10 23 16.40	6.041	11 18 22.4	34.71	0.423 3590	110.3	1.77	3.32	23 23.5
7	10 25 41.28	6.032	11 4 27.3	34.88	0.423 0885	115.1	1.77	3.32	23 22.0
8	10 28 5.95	6.023	10 50 28.2	35.04	0.422 8066	119.9	1.77	3.32	23 20.5
9	10 30 30.39	6.014	10 36 25.2	35.21	0.422 5132	124.6	1.77	3.33	23 19.0
10	10 32 54.62	+6.005	+10 22 18.4	-35.36	0.422 2083	-129.4	1.77	3.33	23 17.4
11	10 35 18.63	5.996	10 8 8.0	35.51	0.421 8920	134.2	1.77	3.33	23 15.9
12	10 37 42.43	5.988	9 53 54.0	35.66	0.421 5641	139.1	1.77	3.33	23 14.3
13	10 40 6.04	5.980	9 39 36.5	35.80	0.421 2245	143.9	1.78	3.34	23 12.8
14	10 42 29.45	5.971	9 25 15.7	35.94	0.420 8735	148.6	1.78	3.34	23 11.2
15	10 44 52.66	+5.963	+ 9 10 51.5	-36.07	0.420 5110	-153.4	1.78	3.34	23 9.6
16	10 47 15.68	5.955	8 56 24.3	36.20	0.420 1371	158.2	1.78	3.34	23 8.1
17	10 49 38.51	5.947	8 41 53.9	36.33	0.419 7517	163.0	1.78	3.35	23 6.5
18	10 52 1.16	5.940	8 27 20.5	36.45	0.419 3549	167.7	1.78	3.35	23 5.0
19	10 54 23.64	5.933	8 12 44.3	36.57	0.418 9467	172.5	1.78	3.35	23 3.4
20	10 56 45.95	+5.926	+ 7 58 5.2	-36.69	0.418 5271	-177.2	1.79	3.36	23 1.8
21	10 59 8.10	5.920	7 43 23.4	36.80	0.418 0962	181.9	1.79	3.36	23 0.3
22	11 1 30.09	5.913	7 28 38.9	36.91	0.417 6540	186.6	1.79	3.36	22 58.7
23	11 3 51.93	5.907	7 13 51.9	37.01	0.417 2004	191.4	1.79	3.37	22 57.1
24	11 6 13.64	5.902	6 59 2.5	37.11	0.416 7354	196.1	1.79	3.37	22 55.6
25	11 8 35.21	+5.896	+ 6 44 10.6	-37.21	0.416 2590	-200.9	1.79	3.37	22 54.0
26	11 10 56.66	5.891	6 29 16.4	37.30	0.415 7711	205.7	1.80	3.38	22 52.4
27	11 13 17.99	5.886	6 14 20.0	37.39	0.415 2716	210.5	1.80	3.38	22 50.8
28	11 15 39.19	5.881	5 59 21.5	37.48	0.414 7605	215.4	1.80	3.39	22 49.2
29	11 18 0.30	5.877	5 44 21.0	37.56	0.414 2378	220.2	1.80	3.39	22 47.6
30	11 20 21.31	+5.873	+ 5 29 18.5	-37.64	0.413 7034	-225.1	1.80	3.39	22 46.0
Oct. 1	11 22 42.23	+5.870	+ 5 14 14.2	-37.72	0.413 1573	-230.0	1.81	3.40	22 44.4

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.									Noon.	
	h	m	s	s	°	'	"	"			"	"	h	m	
Oct.	1	11	22	42.23	+5.870	+5	14	14.2	-37.72	0.413 1573	-230.0	1.81	3.40	22	44.4
	2	11	25	3.07	5.866	4	59	8.1	37.79	0.412 5992	235.0	1.81	3.40	22	42.8
	3	11	27	23.82	5.863	4	44	0.3	37.86	0.412 0292	240.0	1.81	3.41	22	41.2
	4	11	29	44.50	5.860	4	28	50.9	37.92	0.411 4473	245.0	1.81	3.41	22	39.6
	5	11	32	5.10	5.857	4	13	40.1	37.98	0.410 8533	250.0	1.82	3.42	22	38.0
	6	11	34	25.64	+5.854	+3	58	27.8	-38.04	0.410 2471	-255.1	1.82	3.42	22	36.4
	7	11	36	46.11	5.852	3	43	14.2	38.09	0.409 6286	260.3	1.82	3.43	22	34.8
	8	11	39	6.53	5.850	3	27	59.5	38.14	0.408 9978	265.4	1.82	3.43	22	33.2
	9	11	41	26.90	5.848	3	12	43.7	38.18	0.408 3548	270.5	1.83	3.44	22	31.6
	10	11	43	47.22	5.846	2	57	26.8	38.22	0.407 6993	275.7	1.83	3.44	22	30.0
	11	11	46	7.50	+5.844	+2	42	9.0	-38.26	0.407 0315	-280.8	1.84	3.45	22	28.4
	12	11	48	27.74	5.842	2	26	50.5	38.29	0.406 3513	286.0	1.84	3.45	22	26.8
	13	11	50	47.94	5.841	2	11	31.2	38.32	0.405 6587	291.1	1.84	3.46	22	25.2
	14	11	53	8.11	5.840	1	56	11.3	38.34	0.404 9538	296.3	1.84	3.46	22	23.6
	15	11	55	28.24	5.839	1	40	50.9	38.36	0.404 2364	301.4	1.85	3.47	22	22.0
	16	11	57	48.36	+5.838	+1	25	30.1	-38.37	0.403 5069	-306.5	1.85	3.48	22	20.4
	17	12	0	8.47	5.837	1	10	9.0	38.38	0.402 7651	311.6	1.85	3.48	22	18.8
	18	12	2	28.56	5.837	0	54	47.7	38.39	0.402 0111	316.7	1.86	3.49	22	17.2
	19	12	4	48.66	5.837	0	39	26.2	38.40	0.401 2449	321.8	1.86	3.49	22	15.6
	20	12	7	8.76	5.838	0	24	4.7	38.40	0.400 4665	326.9	1.86	3.50	22	14.0
	21	12	9	28.88	+5.839	+0	8	43.2	-38.39	0.399 6758	-332.0	1.87	3.51	22	12.4
	22	12	11	49.02	5.840	-0	6	38.2	38.39	0.398 8729	337.1	1.87	3.51	22	10.8
	23	12	14	9.19	5.841	0	21	59.4	38.38	0.398 0577	342.2	1.87	3.52	22	9.2
	24	12	16	29.40	5.843	0	37	20.4	38.37	0.397 2303	347.3	1.88	3.53	22	7.5
	25	12	18	49.64	5.845	0	52	41.0	38.35	0.396 3905	352.5	1.88	3.53	22	5.9
	26	12	21	9.94	+5.847	-1	8	1.1	-38.33	0.395 5382	-357.7	1.88	3.54	22	4.3
	27	12	23	30.29	5.849	1	23	20.7	38.30	0.394 6734	362.9	1.89	3.55	22	2.7
	28	12	25	50.70	5.852	1	38	39.7	38.28	0.393 7962	368.1	1.89	3.55	22	1.1
	29	12	28	11.18	5.855	1	53	58.0	38.24	0.392 9063	373.1	1.89	3.56	21	59.5
	30	12	30	31.74	5.858	2	9	15.4	38.21	0.392 0037	378.7	1.90	3.57	21	57.9
Nov.	31	12	32	52.38	+5.862	-2	24	31.9	-38.17	0.391 0884	-384.0	1.90	3.58	21	56.4
	1	12	35	13.10	5.865	2	39	47.5	38.13	0.390 1603	389.4	1.90	3.58	21	54.8
	2	12	37	33.92	5.870	2	55	2.0	38.08	0.389 2192	394.8	1.91	3.59	21	53.2
	3	12	39	54.84	5.874	3	10	15.3	38.03	0.388 2652	400.2	1.92	3.60	21	51.6
	4	12	42	15.86	5.878	3	25	27.3	37.97	0.387 2980	405.8	1.92	3.61	21	50.0
	5	12	44	36.99	+5.882	-3	40	38.0	-37.92	0.386 3175	-411.2	1.93	3.62	21	48.4
	6	12	46	58.22	5.887	3	55	47.2	37.85	0.385 3240	416.7	1.93	3.62	21	46.8
	7	12	49	19.56	5.892	4	10	54.7	37.78	0.384 3171	422.3	1.93	3.63	21	45.2
	8	12	51	41.02	5.897	4	26	0.6	37.71	0.383 2970	427.8	1.94	3.64	21	43.6
	9	12	54	2.60	5.902	4	41	4.7	37.63	0.382 2635	433.4	1.94	3.65	21	42.1
	10	12	56	24.30	+5.907	-4	56	6.9	-37.55	0.381 2167	-438.9	1.95	3.66	21	40.5
	11	12	58	46.13	5.912	5	11	7.1	37.47	0.380 1567	444.4	1.95	3.67	21	38.9
	12	13	1	8.09	5.918	5	26	5.2	37.38	0.379 0835	449.9	1.96	3.68	21	37.4
	13	13	3	30.18	5.923	5	41	1.1	37.28	0.377 9970	455.4	1.96	3.69	21	35.8
	14	13	5	52.41	5.929	5	55	54.7	37.18	0.376 8975	460.9	1.96	3.69	21	34.2
	15	13	8	14.79	+5.936	-6	10	45.9	-37.08	0.375 7848	-466.4	1.97	3.70	21	32.6
16	13	10	37.32	+5.942	-6	25	34.6	-36.98	0.374 6590	-471.8	1.97	3.71	21	31.1	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
Nov. 16	13	10	37.32	+5.942	- 6	25	34.6	-36.98	0.374 6590	-471.8	1.97	3.71	21	31.1
17	13	13	0.01	5.948	6	40	20.7	36.87	0.373 5201	477.2	1.98	3.72	21	29.5
18	13	15	22.85	5.956	6	55	4.2	36.76	0.372 3682	482.7	1.98	3.73	21	28.0
19	13	17	45.88	5.963	7	9	44.9	36.64	0.371 2030	488.2	1.99	3.74	21	26.4
20	13	20	9.08	5.971	7	24	22.7	36.51	0.370 0248	493.7	2.00	3.75	21	24.8
21	13	22	32.47	+5.978	- 7	38	57.6	-36.39	0.368 8333	-499.2	2.00	3.76	21	23.3
22	13	24	56.04	5.986	7	53	29.5	36.27	0.367 6287	504.7	2.01	3.77	21	21.8
23	13	27	19.81	5.995	8	7	58.3	36.13	0.366 4109	510.2	2.02	3.79	21	20.2
24	13	29	43.79	6.003	8	22	23.9	36.00	0.365 1797	515.8	2.02	3.80	21	18.7
25	13	32	7.97	6.012	8	36	46.2	35.86	0.363 9352	521.3	2.03	3.81	21	17.1
26	13	34	32.36	+6.021	- 8	51	5.1	-35.72	0.362 6773	-527.0	2.03	3.82	21	15.6
27	13	36	56.97	6.030	9	5	20.5	35.57	0.361 4058	532.6	2.04	3.83	21	14.1
28	13	39	21.50	6.039	9	19	32.3	35.42	0.360 1208	538.2	2.04	3.84	21	12.5
29	13	41	46.86	6.049	9	33	40.4	35.26	0.358 8222	543.9	2.05	3.85	21	11.0
30	13	44	12.15	6.059	9	47	44.7	35.10	0.357 5099	549.7	2.05	3.86	21	9.5
Dec. 1	13	46	37.67	+6.068	-10	1	45.2	-34.94	0.356 1838	-555.5	2.06	3.88	21	8.0
2	13	49	3.43	6.078	10	15	41.7	34.77	0.354 8437	561.3	2.07	3.89	21	6.5
3	13	51	29.42	6.088	10	29	34.2	34.60	0.353 4895	567.2	2.07	3.90	21	5.0
4	13	53	55.67	6.099	10	43	22.4	34.42	0.352 1213	573.0	2.08	3.91	21	3.5
5	13	56	22.15	6.109	10	57	6.4	34.24	0.350 7390	578.9	2.09	3.92	21	2.0
6	13	58	48.88	+6.119	-11	10	46.0	-34.06	0.349 3425	-584.8	2.10	3.94	21	0.5
7	14	1	15.86	6.129	11	24	21.1	33.87	0.347 9318	590.8	2.10	3.95	20	59.0
8	14	3	43.08	6.139	11	37	51.5	33.67	0.346 5069	596.7	2.11	3.96	20	57.5
9	14	6	10.55	6.150	11	51	17.2	33.47	0.345 0679	602.5	2.12	3.98	20	56.1
10	14	8	38.27	6.160	12	4	38.1	33.27	0.343 6149	608.4	2.12	3.99	20	54.6
11	14	11	6.24	+6.171	-12	17	54.0	-33.06	0.342 1478	-614.2	2.13	4.00	20	53.1
12	14	13	34.47	6.181	12	31	4.9	32.85	0.340 6668	620.0	2.14	4.02	20	51.6
13	14	16	2.95	6.192	12	44	10.7	32.63	0.339 1717	625.9	2.14	4.03	20	50.2
14	14	18	31.70	6.203	12	57	11.2	32.41	0.337 6627	631.6	2.15	4.04	20	48.7
15	14	21	0.71	6.214	13	10	6.4	32.19	0.336 1398	637.4	2.16	4.06	20	47.3
16	14	23	29.99	+6.226	-13	22	56.2	-31.96	0.334 6030	-643.2	2.17	4.07	20	45.8
17	14	25	59.54	6.237	13	35	40.4	31.73	0.333 0523	649.0	2.18	4.09	20	44.4
18	14	28	29.37	6.249	13	48	19.1	31.49	0.331 4877	654.8	2.18	4.10	20	42.9
19	14	30	59.49	6.261	14	0	52.0	31.25	0.329 9091	660.6	2.19	4.12	20	41.5
20	14	33	29.88	6.273	14	13	19.2	31.01	0.328 3167	666.4	2.20	4.13	20	40.1
21	14	36	0.57	+6.285	-14	25	40.4	-30.76	0.326 7103	-672.2	2.21	4.15	20	38.6
22	14	38	31.55	6.297	14	37	55.7	30.51	0.325 0899	678.1	2.21	4.16	20	37.2
23	14	41	2.82	6.309	14	50	4.9	30.26	0.323 4555	684.0	2.22	4.18	20	35.8
24	14	43	34.39	6.322	15	2	8.0	30.00	0.321 8068	689.9	2.23	4.19	20	34.4
25	14	46	6.26	6.334	15	14	4.9	29.74	0.320 1441	695.8	2.24	4.21	20	33.0
26	14	48	38.43	+6.347	-15	25	55.4	-29.47	0.318 4670	-701.8	2.25	4.23	20	31.6
27	14	51	10.91	6.360	15	37	39.5	29.20	0.316 7756	707.8	2.26	4.24	20	30.2
28	14	53	43.69	6.372	15	49	17.0	28.93	0.315 0696	713.8	2.27	4.26	20	28.8
29	14	56	16.77	6.385	16	0	47.9	28.65	0.313 3493	719.8	2.28	4.28	20	27.4
30	14	58	50.16	6.398	16	12	12.1	28.37	0.311 6143	725.9	2.28	4.29	20	26.1
31	15	1	23.85	+6.410	-16	23	29.5	-28.08	0.309 8647	-732.1	2.29	4.31	20	24.7
32	15	3	57.85	...	-16	34	39.9	...	0.308 1002	...	2.30	4.33	20	23.3

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Jan.	0	23 39 51.5	35 52.5	-41.6	-0 47 27.4	+62.9	0.153 2556	+3007
	2	24 51 30.4	35 46.4	40.1	0 45 21.3	63.3	0.153 8620	3057
	4	26 2 57.1	35 40.3	38.6	0 43 14.4	63.7	0.154 4782	3105
	6	27 14 11.5	35 34.1	37.0	0 41 6.7	64.0	0.155 1039	3151
	8	28 25 13.5	35 27.8	35.4	0 38 58.3	64.4	0.155 7386	3196
	10	29 36 2.8	35 21.5	-33.6	-0 36 49.3	+61.7	0.156 3821	+3239
	12	30 46 39.4	35 15.1	31.9	0 34 39.7	64.9	0.157 0340	3280
	14	31 57 3.3	35 8.7	30.1	0 32 29.7	65.1	0.157 6940	3320
	16	33 7 14.1	35 2.2	28.3	0 30 19.2	65.3	0.158 3617	3357
	18	34 17 11.9	34 55.6	26.4	0 28 8.4	65.5	0.159 0368	3393
	20	35 26 56.6	34 49.1	-24.4	-0 25 57.3	+65.6	0.159 7189	+3428
	22	36 36 28.1	34 42.4	22.5	0 23 46.0	65.7	0.160 4078	3461
	24	37 45 46.2	34 35.7	20.5	0 21 34.5	65.8	0.161 1030	3491
	26	38 54 51.0	34 29.0	18.5	0 19 22.9	65.8	0.161 8042	3521
	28	40 3 42.3	34 22.3	16.5	0 17 11.3	65.8	0.162 5112	3549
	30	41 12 20.1	34 15.5	-14.4	-0 14 59.7	+65.8	0.163 2235	+3574
Feb.	1	42 20 44.3	34 8.7	12.3	0 12 48.1	65.8	0.163 9408	3599
	3	43 28 55.0	34 1.9	10.2	0 10 36.7	65.7	0.164 6629	3622
	5	44 36 52.0	33 55.1	8.1	0 8 25.5	65.5	0.165 3893	3642
	7	45 44 35.4	33 48.3	6.0	0 6 14.6	65.4	0.166 1197	3662
	9	46 52 5.0	33 41.4	- 3.9	-0 4 3.9	+65.3	0.166 8539	+3680
	11	47 59 20.9	33 34.6	- 1.8	-0 1 53.6	65.1	0.167 5914	3696
	13	49 6 23.2	33 27.7	+ 0.3	+0 0 16.3	64.9	0.168 3321	3711
	15	50 13 11.7	33 20.8	2.4	0 2 25.8	64.6	0.169 0755	3723
	17	51 19 46.4	33 13.9	4.4	0 4 34.8	64.4	0.169 8214	3735
	19	52 26 7.5	33 7.1	+ 6.5	+0 6 43.2	+64.1	0.170 5695	+3745
	21	53 32 14.9	33 0.3	8.6	0 8 51.0	63.8	0.171 3194	3753
	23	54 38 8.6	32 53.4	10.6	0 10 58.2	63.5	0.172 0708	3760
	25	55 43 48.7	32 46.6	12.6	0 13 4.8	63.1	0.172 8235	3766
	27	56 49 15.1	32 39.8	14.6	0 15 10.6	62.7	0.173 5772	3771
Mar.	1	57 54 27.9	32 33.0	+16.5	+0 17 15.6	+62.3	0.174 3316	+3773
	3	58 59 27.2	32 26.3	18.4	0 19 19.8	61.9	0.175 0863	3774
	5	60 4 13.0	32 19.5	20.3	0 21 23.2	61.5	0.175 8412	3774
	7	61 8 45.3	32 12.8	22.2	0 23 25.7	61.0	0.176 5959	3772
	9	62 13 4.2	32 6.1	24.0	0 25 27.3	60.6	0.177 3501	3770
	11	63 17 9.8	31 59.5	+25.8	+0 27 28.0	+60.1	0.178 1037	+3766
	13	64 21 2.1	31 52.8	27.5	0 29 27.6	59.6	0.178 8564	3760
	15	65 24 41.2	31 46.2	29.2	0 31 26.2	59.1	0.179 6078	3753
	17	66 28 7.1	31 39.7	30.9	0 33 23.8	58.5	0.180 3577	3745
	19	67 31 20.0	31 33.2	32.5	0 35 20.3	58.0	0.181 1059	3736
	21	68 34 19.9	31 26.7	+34.0	+0 37 15.7	+57.4	0.181 8522	+3726
	23	69 37 6.8	31 20.3	35.5	0 39 9.9	56.8	0.182 5963	3714
	25	70 39 41.0	31 13.9	37.0	0 41 3.0	56.2	0.183 3379	3702
	27	71 42 2.4	31 7.5	38.4	0 42 54.9	55.6	0.184 0769	3688
	29	72 44 11.2	31 1.3	39.7	0 44 45.5	55.0	0.184 8130	3673
	31	73 46 7.5	30 55.0	+41.0	+0 46 34.9	+54.4	0.185 5459	+3656
Apr.	2	74 47 51.3	30 48.8	+42.2	+0 48 23.0	+53.8	0.186 2755	+3639

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Apr.	2	74 47 51.3	30 48.8	+42.2	+0 48 23.0	+53.8	0.186 2755	+3639
	4	75 49 22.8	30 42.7	43.4	0 50 9.9	53.1	0.187 0016	3621
	6	76 50 42.0	30 36.6	44.5	0 51 55.4	52.4	0.187 7240	3602
	8	77 51 49.1	30 30.5	45.5	0 53 39.6	51.8	0.188 4423	3582
	10	78 52 44.2	30 24.6	46.5	0 55 22.4	51.1	0.189 1566	3560
	12	79 53 27.4	30 18.6	+47.4	+0 57 3.9	+50.4	0.189 8664	+3538
	14	80 53 58.8	30 12.8	48.3	0 58 43.9	49.7	0.190 5718	3515
	16	81 54 18.5	30 7.0	49.1	1 0 22.6	49.0	0.191 2724	3491
	18	82 54 26.7	30 1.2	49.8	1 1 59.8	48.3	0.191 9680	3466
	20	83 54 23.4	29 55.5	50.5	1 3 35.6	47.5	0.192 6586	3440
	22	84 54 8.8	29 49.9	+51.1	+1 5 9.9	+46.8	0.193 3440	+3413
	24	85 53 43.0	29 44.3	51.7	1 6 42.8	46.1	0.194 0239	3386
	26	86 53 6.2	29 38.8	52.2	1 8 14.2	45.3	0.194 6982	3357
	28	87 52 18.4	29 33.4	52.6	1 9 44.0	44.6	0.195 3667	3328
	30	88 51 19.8	29 28.0	52.9	1 11 12.4	43.8	0.196 0293	3298
May	2	89 50 10.5	29 22.7	+53.2	+1 12 39.3	+43.1	0.196 6858	+3267
	4	90 48 50.7	29 17.5	53.5	1 14 4.6	42.3	0.197 3361	3236
	6	91 47 20.4	29 12.3	53.6	1 15 28.3	41.5	0.197 9801	3204
	8	92 45 39.9	29 7.2	53.7	1 16 50.5	40.7	0.198 6175	3170
	10	93 43 49.2	29 2.1	53.8	1 18 11.2	40.0	0.199 2482	3137
	12	94 41 48.5	28 57.2	+53.8	+1 19 30.3	+39.2	0.199 8722	+3103
	14	95 39 38.0	28 52.3	53.7	1 20 47.8	38.4	0.200 4892	3068
	16	96 37 17.7	28 47.5	53.5	1 22 3.8	37.6	0.201 0992	3032
	18	97 34 47.9	28 42.7	53.3	1 23 18.1	36.8	0.201 7020	2996
	20	98 32 8.6	28 38.0	53.1	1 24 30.8	36.0	0.202 2975	2959
	22	99 29 20.0	28 33.4	+52.8	+1 25 42.0	+35.2	0.202 8856	+2922
	24	100 26 22.2	28 28.8	52.4	1 26 51.5	34.4	0.203 4662	2884
	26	101 23 15.4	28 24.4	52.0	1 27 59.4	33.6	0.204 0391	2845
	28	102 19 59.7	28 20.0	51.5	1 29 5.7	32.8	0.204 6042	2806
	30	103 16 35.3	28 15.6	51.0	1 30 10.4	32.0	0.205 1615	2767
June	1	104 13 2.3	28 11.4	+50.4	+1 31 13.5	+31.1	0.205 7108	+2726
	3	105 9 20.9	28 7.2	49.7	1 32 14.9	30.3	0.206 2520	2686
	5	106 5 31.2	28 3.1	49.0	1 33 14.7	29.5	0.206 7851	2645
	7	107 1 33.3	27 59.0	48.3	1 34 12.9	28.7	0.207 3100	2604
	9	107 57 27.4	27 55.1	47.5	1 35 9.4	27.9	0.207 8265	2561
	11	108 53 13.7	27 51.2	+46.6	+1 36 4.3	+27.1	0.208 3345	+2519
	13	109 48 52.3	27 47.4	45.7	1 36 57.6	26.2	0.208 8340	2476
	15	110 44 23.3	27 43.6	44.8	1 37 49.2	25.4	0.209 3249	2433
	17	111 39 46.9	27 40.0	43.8	1 38 39.1	24.6	0.209 8071	2389
	19	112 35 3.2	27 36.4	42.8	1 39 27.5	23.8	0.210 2806	2345
	21	113 30 12.4	27 32.9	+41.7	+1 40 14.2	+22.9	0.210 7452	+2301
	23	114 25 14.7	27 29.4	40.6	1 40 59.2	22.1	0.211 2009	2256
	25	115 20 10.2	27 26.1	39.5	1 41 42.6	21.3	0.211 6476	2211
	27	116 14 59.0	27 22.7	38.3	1 42 24.4	20.5	0.212 0852	2165
	29	117 9 41.2	27 19.5	37.1	1 43 4.6	19.7	0.212 5137	2120
July	1	118 4 17.1	27 16.4	+35.8	+1 43 43.1	+18.8	0.212 9330	+2074
	3	118 58 46.8	27 13.3	+34.5	+1 44 19.9	+18.0	0.213 3431	+2027

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
July	1	118 4 17.1	27 16.4	+35.8	+1 43 43.1	+18.8	0.212 9330	+2074
	3	118 58 46.8	27 13.3	34.5	1 44 19.9	18.0	0.213 3431	2027
	5	119 53 10.5	27 10.3	33.2	1 44 55.1	17.2	0.213 7438	1980
	7	120 47 28.2	27 7.4	31.9	1 45 28.7	16.4	0.214 1352	1933
	9	121 41 40.1	27 4.5	30.5	1 46 0.7	15.6	0.214 5171	1886
	11	122 35 46.4	27 1.8	+29.1	+1 46 31.0	+14.8	0.214 8896	+1839
	13	123 29 47.3	26 59.1	27.7	1 46 59.7	14.0	0.215 2526	1791
	15	124 23 42.9	26 56.5	26.2	1 47 26.8	13.1	0.215 6059	1743
	17	125 17 33.3	26 53.9	24.7	1 47 52.2	12.3	0.215 9496	1694
	19	126 11 18.7	26 51.5	23.2	1 48 16.0	11.5	0.216 2836	1646
	21	127 4 59.2	26 49.1	+21.7	+1 48 38.2	+10.7	0.216 6079	+1597
	23	127 58 35.0	26 46.8	20.1	1 48 58.8	9.9	0.216 9225	1548
	25	128 52 6.3	26 44.5	18.6	1 49 17.8	9.1	0.217 2272	1499
	27	129 45 33.1	26 42.3	17.0	1 49 35.2	8.3	0.217 5221	1450
	29	130 38 55.6	26 40.2	15.4	1 49 50.9	7.5	0.217 8071	1400
	31	131 32 14.1	26 38.2	+13.8	+1 50 5.0	+ 6.7	0.218 0821	+1350
Aug.	2	132 25 28.6	26 36.3	12.2	1 50 17.6	5.9	0.218 3472	1301
	4	133 18 39.3	26 34.4	10.6	1 50 28.5	5.1	0.218 6023	1251
	6	134 11 46.3	26 32.6	8.9	1 50 37.9	4.3	0.218 8474	1200
	8	135 4 49.8	26 30.9	7.3	1 50 45.7	3.5	0.219 0824	1150
	10	135 57 50.0	26 29.3	+ 5.6	+1 50 51.8	+ 2.7	0.219 3073	+1099
	12	136 50 46.9	26 27.7	4.0	1 50 56.4	1.9	0.219 5221	1049
	14	137 43 40.7	26 26.2	2.3	1 50 59.4	1.1	0.219 7268	998
	16	138 36 31.7	26 24.8	+ 0.7	1 51 0.9	+ 0.3	0.219 9213	947
	18	139 29 19.9	26 23.4	- 1.0	1 51 0.7	- 0.5	0.220 1056	896
	20	140 22 5.4	26 22.1	- 2.6	+1 50 59.0	- 1.2	0.220 2797	+ 845
	22	141 14 48.5	26 21.0	4.3	1 50 55.7	2.0	0.220 4436	794
	24	142 7 29.3	26 19.8	5.9	1 50 50.9	2.8	0.220 5973	742
	26	143 0 7.9	26 18.8	7.5	1 50 44.5	3.6	0.220 7406	691
	28	143 52 44.5	26 17.8	9.2	1 50 36.6	4.3	0.220 8737	640
	30	144 45 19.3	26 16.9	-10.8	+1 50 27.1	- 5.1	0.220 9965	+ 588
Sept.	1	145 37 52.3	26 16.1	12.4	1 50 16.1	5.9	0.221 1090	536
	3	146 30 23.7	26 15.3	14.0	1 50 3.5	6.7	0.221 2111	485
	5	147 22 53.7	26 14.7	15.6	1 49 49.4	7.4	0.221 3029	433
	7	148 15 22.5	26 14.1	17.1	1 49 33.8	8.2	0.221 3843	381
	9	149 7 50.2	26 13.6	-18.7	+1 49 16.7	- 8.9	0.221 4554	+ 330
	11	150 0 16.8	26 13.1	20.2	1 48 58.0	9.7	0.221 5161	278
	13	150 52 42.7	26 12.7	21.7	1 48 37.8	10.5	0.221 5665	226
	15	151 45 7.8	26 12.4	23.2	1 48 16.1	11.2	0.221 6064	174
	17	152 37 32.5	26 12.2	24.7	1 47 52.9	12.0	0.221 6360	122
	19	153 29 56.7	26 12.1	-26.1	+1 47 28.2	-12.7	0.221 6552	+ 70
	21	154 22 20.8	26 12.0	27.5	1 47 2.0	13.5	0.221 6640	+ 18
	23	155 14 44.7	26 12.0	28.9	1 46 34.3	14.2	0.221 6624	- 34
	25	156 7 8.8	26 12.1	30.3	1 46 5.1	15.0	0.221 6505	86
	27	156 59 33.0	26 12.2	31.6	1 45 34.4	15.7	0.221 6281	138
	29	157 51 57.6	26 12.4	-33.0	+1 45 2.3	-16.4	0.221 5953	- 190
Oct.	1	158 44 22.8	26 12.7	-34.2	+1 44 28.7	-17.2	0.221 5522	- 242

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
Oct.	1	158 44 22.8	26 12.7	-34.2	+1 44 28.7	-17.2	0.221 5522	- 242
	3	159 36 48.6	26 13.1	35.5	1 43 53.6	17.9	0.221 4987	294
	5	160 29 15.2	26 13.5	36.7	1 43 17.1	18.6	0.221 4348	345
	7	161 21 42.8	26 14.1	37.9	1 42 39.1	19.4	0.221 3606	397
	9	162 14 11.5	26 14.7	39.0	1 41 59.7	20.1	0.221 2760	449
	11	163 6 41.5	26 15.3	-40.1	+1 41 18.8	-20.8	0.221 1810	- 501
	13	163 59 12.9	26 16.1	41.2	1 40 36.5	21.5	0.221 0757	552
	15	164 51 45.9	26 16.9	42.2	1 39 52.8	22.2	0.220 9601	604
	17	165 44 20.5	26 17.8	43.2	1 39 7.6	22.9	0.220 8342	655
	19	166 36 57.1	26 18.8	44.2	1 38 21.1	23.6	0.220 6980	707
	21	167 29 35.6	26 19.8	-45.1	+1 37 33.1	-24.4	0.220 5515	- 758
	23	168 22 16.3	26 20.9	46.0	1 36 43.7	25.1	0.220 3948	809
	25	169 14 59.4	26 22.1	46.8	1 35 52.9	25.8	0.220 2278	861
	27	170 7 44.9	26 23.4	47.6	1 35 0.7	26.5	0.220 0506	912
	29	171 0 33.0	26 24.7	48.4	1 34 7.1	27.1	0.219 8632	963
	31	171 53 23.8	26 26.1	-49.1	+1 33 12.2	-27.8	0.219 6656	-1014
Nov.	2	172 46 17.6	26 27.7	49.7	1 32 15.8	28.5	0.219 4578	1064
	4	173 39 14.5	26 29.2	50.3	1 31 18.1	29.2	0.219 2399	1115
	6	174 32 14.6	26 30.9	50.9	1 30 19.1	29.9	0.219 0119	1165
	8	175 25 18.0	26 32.6	51.4	1 29 18.7	30.6	0.218 7739	1215
	10	176 18 25.0	26 34.4	-51.9	+1 28 16.9	-31.2	0.218 5258	-1266
	12	177 11 35.6	26 36.2	52.3	1 27 13.8	31.9	0.218 2677	1316
	14	178 4 50.0	26 38.2	52.7	1 26 9.4	32.6	0.217 9996	1366
	16	178 58 8.4	26 40.2	53.0	1 25 3.6	33.2	0.217 7215	1415
	18	179 51 31.0	26 42.3	53.2	1 23 56.6	33.9	0.217 4336	1465
	20	180 44 57.8	26 44.5	-53.4	+1 22 48.2	-34.5	0.217 1357	-1514
	22	181 38 29.0	26 46.7	53.6	1 21 38.5	35.2	0.216 8280	1563
	24	182 32 4.8	26 49.1	53.7	1 20 27.6	35.8	0.216 5105	1612
	26	183 25 45.3	26 51.5	53.8	1 19 15.4	36.4	0.216 1833	1660
	28	184 19 30.7	26 54.0	53.8	1 18 1.9	37.1	0.215 8464	1709
	30	185 13 21.2	26 56.5	-53.7	+1 16 47.1	-37.7	0.215 4998	-1757
Dec.	2	186 7 16.8	26 59.1	53.6	1 15 31.1	38.3	0.215 1435	1805
	4	187 1 17.7	27 1.8	53.5	1 14 13.8	39.0	0.214 7777	1853
	6	187 55 24.2	27 4.6	53.3	1 12 55.3	39.6	0.214 4024	1900
	8	188 49 36.3	27 7.5	53.0	1 11 35.6	40.2	0.214 0177	1947
	10	189 43 54.1	27 10.4	-52.7	+1 10 14.6	-40.8	0.213 6235	-1995
	12	190 38 17.9	27 13.4	52.3	1 8 52.5	41.4	0.213 2199	2041
	14	191 32 47.8	27 16.5	51.9	1 7 29.1	42.0	0.212 8071	2087
	16	192 27 23.9	27 19.6	51.4	1 6 4.6	42.6	0.212 3851	2133
	18	193 22 6.4	27 22.9	50.9	1 4 38.9	43.1	0.211 9538	2179
	20	194 16 55.5	27 26.2	-50.3	+1 3 12.1	-43.7	0.211 5135	-2224
	22	195 11 51.3	27 29.6	49.7	1 1 44.1	44.3	0.211 0642	2269
	24	196 6 53.9	27 33.0	49.0	1 0 15.0	44.8	0.210 6058	2314
	26	197 2 3.5	27 36.6	48.3	0 58 44.8	45.4	0.210 1386	2358
	28	197 57 20.3	27 40.2	47.5	0 57 13.4	46.0	0.209 6626	2402
	30	198 52 44.3	27 43.9	-46.7	+0 55 41.0	-46.5	0.209 1778	-2446
	32	199 48 15.8	27 47.6	-45.8	+0 54 7.5	-47.0	0.208 6844	-2489

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m
Jan.	1	h m s	s	° ' "	"						"	"	h m
	14 44 43.88	+1.606	-14 47 39.8	-7.02	0.771 8110	-418.1	15.54	1.49	20 1.5				
	14 45 22.23	1.590	14 50 27.2	6.92	0.770 8017	423.0	15.58	1.49	19 58.2				
	14 46 0.19	1.573	14 53 12.2	6.82	0.769 7807	427.8	15.62	1.50	19 54.9				
	14 46 37.74	1.556	14 55 54.8	6.72	0.768 7481	432.6	15.65	1.50	19 51.6				
	14 47 14.89	1.539	14 58 35.0	6.62	0.767 7040	437.4	15.69	1.50	19 48.3				
	14 47 51.63	+1.522	-15 1 12.7	-6.52	0.766 6486	-442.1	15.73	1.51	19 45.0				
	14 48 27.95	1.504	15 3 48.0	6.42	0.765 5819	446.8	15.77	1.51	19 41.6				
	14 49 3.84	1.486	15 6 20.8	6.31	0.764 5041	451.4	15.81	1.51	19 38.3				
	14 49 39.30	1.468	15 8 51.1	6.21	0.763 4152	456.0	15.85	1.52	19 34.9				
	14 50 14.31	1.449	15 11 18.9	6.10	0.762 3155	460.5	15.89	1.52	19 31.6				
	14 50 48.87	+1.430	-15 13 44.1	-6.00	0.761 2049	-465.0	15.93	1.52	19 28.2				
	14 51 22.96	1.411	15 16 6.8	5.89	0.760 0838	469.3	15.97	1.53	19 24.8				
	14 51 56.58	1.391	15 18 26.9	5.78	0.758 9523	473.6	16.01	1.53	19 21.5				
	14 52 29.73	1.371	15 20 44.4	5.67	0.757 8106	477.8	16.05	1.54	19 18.1				
	14 53 2.39	1.350	15 22 59.3	5.56	0.756 6588	482.0	16.10	1.54	19 14.7				
	14 53 34.55	+1.330	-15 25 11.5	-5.45	0.755 4972	-486.0	16.14	1.54	19 11.2				
	14 54 6.21	1.309	15 27 21.1	5.34	0.754 3260	490.0	16.18	1.55	19 7.8				
	14 54 37.36	1.287	15 29 28.0	5.23	0.753 1454	493.9	16.23	1.55	19 4.4				
	14 55 7.98	1.265	15 31 32.3	5.12	0.751 9555	497.7	16.27	1.56	19 1.0				
	14 55 38.08	1.243	15 33 33.8	5.01	0.750 7566	501.4	16.32	1.56	18 57.6				
	14 56 7.65	+1.221	-15 35 32.7	-4.90	0.749 5490	-505.0	16.36	1.57	18 54.1				
	14 56 36.67	1.198	15 37 28.8	4.78	0.748 3328	508.5	16.41	1.57	18 50.6				
	14 57 5.15	1.175	15 39 22.2	4.67	0.747 1084	511.9	16.45	1.58	18 47.2				
	14 57 33.08	1.152	15 41 12.8	4.55	0.745 8759	515.2	16.50	1.58	18 43.7				
	14 58 0.44	1.128	15 43 0.6	4.44	0.744 6356	518.4	16.55	1.58	18 40.2				
	14 58 27.23	+1.104	-15 44 45.7	-4.32	0.743 3878	-521.5	16.60	1.59	18 36.7				
	14 58 53.45	1.080	15 46 28.0	4.20	0.742 1327	524.5	16.64	1.59	18 33.2				
	14 59 19.09	1.056	15 48 7.5	4.09	0.740 8705	527.4	16.69	1.60	18 29.7				
	14 59 44.14	1.031	15 49 44.2	3.97	0.739 6015	530.1	16.74	1.60	18 26.2				
15 0 8.59	1.006	15 51 18.0	3.85	0.738 3259	532.8	16.79	1.61	18 22.6					
Feb.	15 0 32.44	+0.981	-15 52 49.1	-3.73	0.737 0440	-535.4	16.84	1.61	18 19.1				
	15 0 55.69	0.956	15 54 17.3	3.61	0.735 7560	537.9	16.89	1.62	18 15.6				
	15 1 18.33	0.930	15 55 42.6	3.50	0.734 4621	540.3	16.94	1.62	18 12.0				
	15 1 40.34	0.904	15 57 5.1	3.38	0.733 1627	542.6	16.99	1.63	18 8.4				
	15 2 1.72	0.878	15 58 24.8	3.26	0.731 8579	544.7	17.04	1.63	18 4.8				
	15 2 22.47	+0.851	-15 59 41.5	-3.14	0.730 5481	-546.8	17.09	1.64	18 1.2				
	15 2 42.58	0.824	16 0 55.4	3.02	0.729 2334	548.8	17.15	1.64	17 57.6				
	15 3 2.04	0.797	16 2 6.3	2.89	0.727 9142	550.6	17.20	1.65	17 54.0				
	15 3 20.85	0.770	16 3 14.3	2.77	0.726 5908	552.2	17.25	1.65	17 50.4				
	15 3 38.99	0.742	16 4 19.4	2.65	0.725 2635	553.8	17.30	1.66	17 46.7				
	15 3 56.46	+0.714	-16 5 21.6	-2.53	0.723 9326	-555.2	17.36	1.66	17 43.1				
	15 4 13.25	0.685	16 6 20.8	2.41	0.722 5986	556.5	17.41	1.67	17 39.4				
	15 4 29.36	0.657	16 7 17.1	2.28	0.721 2617	557.6	17.46	1.67	17 35.8				
	15 4 44.77	0.628	16 8 10.3	2.16	0.719 9223	558.5	17.52	1.68	17 32.1				
	15 4 59.49	0.599	16 9 0.6	2.03	0.718 5808	559.3	17.57	1.68	17 28.4				
	15 5 13.50	+0.569	-16 9 47.8	-1.91	0.717 2376	-560.0	17.63	1.69	17 24.7				
15 5 26.81	+0.540	-16 10 32.1	-1.78	0.715 8931	-560.5	17.68	1.69	17 20.9					

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	h	m	s		°	'	"							h	m
Feb. 16	15	5	26.81	+0.540	-16	10	32.1	-1.78	0.715 8931	-560.5	17.68	1.69	17 20.9
17	15	5	39.40	0.510	16	11	13.4	1.66	0.714 5476	560.8	17.73	1.70	17 17.2
18	15	5	51.28	0.480	16	11	51.6	1.53	0.713 2016	560.9	17.79	1.70	17 13.5
19	15	6	2.43	0.450	16	12	26.8	1.40	0.711 8555	560.8	17.85	1.71	17 9.7
20	15	6	12.86	0.420	16	12	59.0	1.28	0.710 5097	560.6	17.90	1.71	17 5.9
21	15	6	22.57	+0.389	-16	13	28.1	-1.15	0.709 1647	-560.2	17.96	1.72	17 2.1
22	15	6	31.54	0.359	16	13	54.2	1.02	0.707 8208	559.6	18.01	1.72	16 58.3
23	15	6	39.78	0.328	16	14	17.3	0.90	0.706 4785	558.9	18.07	1.73	16 54.5
24	15	6	47.28	0.297	16	14	37.3	0.77	0.705 1382	558.0	18.12	1.74	16 50.7
25	15	6	54.04	0.266	16	14	54.3	0.65	0.703 8004	556.9	18.18	1.74	16 46.9
26	15	7	0.06	+0.235	-16	15	8.3	-0.52	0.702 4654	-555.6	18.24	1.75	16 43.1
27	15	7	5.34	0.204	16	15	19.2	0.39	0.701 1336	554.2	18.29	1.75	16 39.2
28	15	7	9.87	0.173	16	15	27.1	0.27	0.699 8055	552.5	18.35	1.76	16 35.3
Mar. 1	15	7	13.65	0.142	16	15	32.0	0.14	0.698 4815	550.7	18.40	1.76	16 31.5
2	15	7	16.69	0.111	16	15	33.9	-0.02	0.697 1620	548.8	18.46	1.77	16 27.6
3	15	7	18.98	+0.080	-16	15	32.8	+0.11	0.695 8475	-546.6	18.51	1.77	16 23.7
4	15	7	20.51	0.048	16	15	28.6	0.24	0.694 5383	544.3	18.57	1.78	16 19.8
5	15	7	21.29	+0.017	16	15	21.4	0.36	0.693 2349	541.8	18.63	1.78	16 15.8
6	15	7	21.32	-0.014	16	15	11.2	0.49	0.691 9378	539.1	18.68	1.79	16 11.9
7	15	7	20.60	0.046	16	14	58.0	0.61	0.690 6475	536.2	18.74	1.79	16 8.0
8	15	7	19.12	-0.078	-16	14	41.8	+0.74	0.689 3643	-533.1	18.79	1.80	16 4.0
9	15	7	16.88	0.109	16	14	22.6	0.86	0.688 0889	529.8	18.85	1.80	16 0.0
10	15	7	13.88	0.111	16	14	0.4	0.99	0.686 8217	526.2	18.90	1.81	15 56.0
11	15	7	10.13	0.172	16	13	35.2	1.11	0.685 5633	522.5	18.96	1.82	15 52.0
12	15	7	5.62	0.204	16	13	7.0	1.24	0.684 3141	518.5	19.01	1.82	15 48.0
13	15	7	0.35	-0.235	-16	12	35.8	+1.36	0.683 0747	-514.3	19.07	1.83	15 44.0
14	15	6	54.33	0.266	16	12	1.6	1.49	0.681 8457	509.9	19.12	1.83	15 39.9
15	15	6	47.57	0.297	16	11	24.4	1.61	0.680 6276	505.2	19.18	1.84	15 35.9
16	15	6	40.06	0.329	16	10	44.3	1.73	0.679 4210	500.3	19.23	1.84	15 31.8
17	15	6	31.80	0.360	16	10	1.3	1.85	0.678 2264	495.2	19.28	1.85	15 27.7
18	15	6	22.81	-0.390	-16	9	15.4	+1.97	0.677 0443	-489.9	19.33	1.85	15 23.6
19	15	6	13.09	0.420	16	8	26.6	2.09	0.675 8753	484.3	19.39	1.86	15 19.5
20	15	6	2.64	0.450	16	7	34.9	2.21	0.674 7199	478.5	19.44	1.86	15 15.4
21	15	5	51.48	0.480	16	6	40.4	2.33	0.673 5786	472.5	19.49	1.87	15 11.3
22	15	5	39.60	0.510	16	5	43.0	2.45	0.672 4520	466.3	19.54	1.87	15 7.2
23	15	5	27.02	-0.539	-16	4	42.8	+2.56	0.671 3406	-459.9	19.59	1.88	15 3.0
24	15	5	13.74	0.568	16	3	39.9	2.68	0.670 2449	453.2	19.64	1.88	14 58.9
25	15	4	59.77	0.596	16	2	34.2	2.79	0.669 1655	446.3	19.69	1.88	14 54.7
26	15	4	45.12	0.624	16	1	25.9	2.90	0.668 1028	439.2	19.74	1.89	14 50.5
27	15	4	29.80	0.652	16	0	14.9	3.01	0.667 0574	431.9	19.78	1.89	14 46.3
28	15	4	13.82	-0.679	-15	59	1.3	+3.12	0.666 0298	-424.4	19.83	1.90	14 42.1
29	15	3	57.20	0.706	15	57	45.1	3.23	0.665 0204	416.7	19.88	1.90	14 37.9
30	15	3	39.93	0.733	15	56	26.3	3.33	0.664 0296	408.9	19.92	1.91	14 33.7
31	15	3	22.02	0.759	15	55	5.0	3.44	0.663 0579	400.8	19.97	1.91	14 29.4
Apr. 1	15	3	3.50	0.784	15	53	41.2	3.54	0.662 1058	392.6	20.01	1.92	14 25.2
2	15	2	44.37	-0.810	-15	52	15.0	+3.64	0.661 1737	-384.2	20.05	1.92	14 21.0
3	15	2	24.64	-0.834	-15	50	46.3	+3.74	0.660 2620	-375.5	20.10	1.92	14 16.7

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
Apr.	1	15	3	3.50	-0.784	-15	53	41.2	+3.54	0.662 1058	-392.6	20.01	1.92	14 25.2
	2	15	2	44.37	0.810	15	52	15.0	3.64	0.661 1737	384.2	20.05	1.92	14 21.0
	3	15	2	24.64	0.834	15	50	46.3	3.74	0.660 2620	375.5	20.10	1.92	14 16.7
	4	15	2	4.32	0.859	15	49	15.4	3.84	0.659 3714	366.7	20.14	1.93	14 12.4
	5	15	1	43.43	0.882	15	47	42.1	3.94	0.658 5022	357.6	20.18	1.93	14 8.1
	6	15	1	21.97	-0.906	-15	46	6.5	+4.03	0.657 6550	-348.4	20.22	1.94	14 3.8
	7	15	0	59.95	0.929	15	44	28.7	4.12	0.656 8301	339.0	20.26	1.94	13 59.5
	8	15	0	37.40	0.951	15	42	48.7	4.21	0.656 0282	329.3	20.29	1.94	13 55.2
	9	15	0	14.32	0.972	15	41	6.6	4.30	0.655 2495	319.5	20.33	1.95	13 50.9
	10	14	59	50.73	0.993	15	39	22.4	4.38	0.654 4946	309.5	20.36	1.95	13 46.6
	11	14	59	26.65	-1.014	-15	37	36.2	+4.46	0.653 7639	-299.3	20.40	1.95	13 42.3
	12	14	59	2.08	1.033	15	35	48.1	4.54	0.653 0579	288.9	20.43	1.96	13 37.9
	13	14	58	37.06	1.052	15	33	58.1	4.62	0.652 3771	278.4	20.46	1.96	13 33.5
	14	14	58	11.59	1.070	15	32	6.3	4.70	0.651 7217	267.7	20.49	1.96	13 29.2
	15	14	57	45.70	1.087	15	30	12.7	4.77	0.651 0923	256.8	20.52	1.96	13 24.8
	16	14	57	19.39	-1.104	-15	28	17.4	+1.84	0.650 4892	-215.8	20.55	1.97	13 20.5
	17	14	56	52.69	1.120	15	26	20.5	4.90	0.649 9126	234.6	20.58	1.97	13 16.1
	18	14	56	25.63	1.135	15	24	22.1	4.96	0.649 3630	223.3	20.61	1.97	13 11.7
	19	14	55	58.21	1.149	15	22	22.2	5.02	0.648 8406	211.9	20.63	1.98	13 7.3
	20	14	55	30.46	1.163	15	20	20.9	5.08	0.648 3459	200.3	20.66	1.98	13 2.9
	21	14	55	2.40	-1.175	-15	18	18.3	+5.13	0.647 8791	-188.7	20.68	1.98	12 58.5
	22	14	54	34.05	1.187	15	16	14.5	5.18	0.647 4403	176.9	20.70	1.98	12 54.1
	23	14	54	5.43	1.198	15	14	9.6	5.23	0.647 0299	165.1	20.72	1.98	12 49.7
	24	14	53	36.56	1.208	15	12	3.7	5.27	0.646 6480	153.2	20.74	1.98	12 45.3
	25	14	53	7.46	1.217	15	9	56.7	5.31	0.646 2947	141.2	20.75	1.99	12 40.9
	26	14	52	38.15	-1.225	-15	7	48.9	+5.31	0.645 9702	-129.2	20.77	1.99	12 36.4
	27	14	52	8.65	1.232	15	5	40.3	5.37	0.645 6746	117.1	20.78	1.99	12 32.0
	28	14	51	38.99	1.239	15	3	31.0	5.40	0.645 4082	104.9	20.80	1.99	12 27.6
	29	14	51	9.17	1.245	15	1	21.1	5.42	0.645 1710	92.7	20.81	1.99	12 23.2
	30	14	50	39.22	1.250	14	59	10.7	5.44	0.644 9631	80.5	20.82	1.99	12 18.8
May	1	14	50	9.16	-1.254	-14	56	59.9	+5.46	0.644 7846	-68.2	20.83	1.99	12 14.3
	2	14	49	39.02	1.257	14	54	48.7	5.47	0.644 6356	55.9	20.83	1.99	12 9.9
	3	14	49	8.81	1.260	14	52	37.2	5.48	0.644 5161	43.6	20.84	2.00	12 5.5
	4	14	48	38.55	1.261	14	50	25.6	5.49	0.644 4261	31.3	20.84	2.00	12 1.0
	5	14	48	8.26	1.262	14	48	13.8	5.49	0.644 3658	18.9	20.84	2.00	11 56.6
	6	14	47	37.97	-1.262	-14	46	2.1	+5.49	0.644 3353	-6.5	20.85	2.00	11 52.2
	7	14	47	7.68	1.261	14	43	50.5	5.48	0.644 3345	+5.9	20.85	2.00	11 47.7
	8	14	46	37.42	1.260	14	41	39.0	5.47	0.644 3635	18.3	20.84	2.00	11 43.3
	9	14	46	7.22	1.257	14	39	27.8	5.46	0.644 4222	30.6	20.84	2.00	11 38.9
	10	14	45	37.09	1.253	14	37	17.0	5.44	0.644 5105	43.0	20.84	2.00	11 34.4
	11	14	45	7.06	-1.249	-14	35	6.7	+5.42	0.644 6284	+55.3	20.83	1.99	11 30.0
	12	14	44	37.14	1.244	14	32	56.9	5.39	0.644 7757	67.5	20.83	1.99	11 25.6
	13	14	44	7.36	1.237	14	30	47.8	5.36	0.644 9525	79.8	20.82	1.99	11 21.2
	14	14	43	37.75	1.230	14	28	39.4	5.33	0.645 1586	92.0	20.81	1.99	11 16.7
	15	14	43	8.31	1.222	14	26	31.9	5.29	0.645 3940	104.1	20.80	1.99	11 12.3
	16	14	42	39.08	-1.213	-14	24	25.4	+5.25	0.645 6583	+116.1	20.78	1.99	11 7.9
	17	14	42	10.07	-1.204	-14	22	20.0	+5.20	0.645 9514	+128.1	20.77	1.99	11 3.5

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
May 17	14 42 10.07	-1.204	-14 22 20.0	+5.20	0.645 9514	+128.1	20.77	1.99	11 3.5
18	14 41 41.30	1.193	14 20 15.7	5.15	0.646 2730	139.9	20.75	1.99	10 59.1
19	14 41 12.80	1.182	14 18 12.7	5.10	0.646 6229	151.6	20.74	1.98	10 54.7
20	14 40 44.58	1.170	14 16 11.0	5.04	0.647 0007	163.2	20.72	1.98	10 50.3
21	14 40 16.66	1.156	14 14 10.7	4.98	0.647 4063	174.7	20.70	1.98	10 45.9
22	14 39 49.07	-1.143	-14 12 12.0	+4.91	0.647 8392	+186.0	20.68	1.98	10 41.5
23	14 39 21.81	1.129	14 10 14.9	4.84	0.648 2992	197.2	20.66	1.98	10 37.1
24	14 38 54.90	1.113	14 8 19.5	4.77	0.648 7859	208.3	20.63	1.98	10 32.7
25	14 38 28.37	1.097	14 6 25.9	4.69	0.649 2990	219.2	20.61	1.97	10 28.4
26	14 38 2.23	1.081	14 4 34.2	4.61	0.649 8381	230.0	20.58	1.97	10 24.0
27	14 37 36.49	-1.064	-14 2 44.4	+4.53	0.650 4027	+240.5	20.56	1.97	10 19.7
28	14 37 11.17	1.046	14 0 56.6	4.45	0.650 9926	251.0	20.53	1.97	10 15.3
29	14 36 46.28	1.028	13 59 11.0	4.36	0.651 6074	261.3	20.50	1.96	10 11.0
30	14 36 21.83	1.009	13 57 27.5	4.27	0.652 2466	271.4	20.47	1.96	10 6.6
31	14 35 57.85	0.990	13 55 46.2	4.17	0.652 9099	281.3	20.44	1.96	10 2.3
June 1	14 35 34.33	-0.970	-13 54 7.3	+4.07	0.653 5969	+291.1	20.41	1.95	9 58.0
2	14 35 11.30	0.949	13 52 30.7	3.97	0.654 3073	300.8	20.37	1.95	9 53.7
3	14 34 48.77	0.928	13 50 56.5	3.87	0.655 0405	310.2	20.34	1.95	9 49.4
4	14 34 26.75	0.907	13 49 24.8	3.77	0.655 7963	319.5	20.30	1.94	9 45.1
5	14 34 5.25	0.885	13 47 55.7	3.66	0.656 5742	328.7	20.27	1.94	9 40.8
6	14 33 44.28	-0.862	-13 46 29.3	+3.55	0.657 3738	+337.6	20.23	1.94	9 36.5
7	14 33 23.87	0.839	13 45 5.5	3.44	0.658 1947	346.4	20.19	1.93	9 32.3
8	14 33 4.02	0.815	13 43 44.4	3.32	0.659 0365	355.1	20.15	1.93	9 28.0
9	14 32 44.74	0.791	13 42 26.2	3.20	0.659 8988	363.5	20.11	1.93	9 23.8
10	14 32 26.05	0.766	13 41 10.9	3.08	0.660 7810	371.7	20.07	1.92	9 19.5
11	14 32 7.95	-0.742	-13 39 58.5	+2.96	0.661 6826	+379.7	20.03	1.92	9 15.3
12	14 31 50.45	0.716	13 38 49.0	2.83	0.662 6032	387.5	19.99	1.91	9 11.1
13	14 31 33.57	0.690	13 37 42.6	2.70	0.663 5422	395.0	19.94	1.91	9 6.9
14	14 31 17.31	0.664	13 36 39.2	2.57	0.664 4992	402.4	19.90	1.90	9 2.7
15	14 31 1.68	0.638	13 35 39.0	2.44	0.665 4737	409.6	19.86	1.90	8 58.5
16	14 30 46.69	-0.611	-13 34 41.9	+2.31	0.666 4652	+416.6	19.81	1.90	8 54.3
17	14 30 32.35	0.584	13 33 48.0	2.18	0.667 4730	423.3	19.76	1.89	8 50.1
18	14 30 18.66	0.556	13 32 57.3	2.04	0.668 4967	429.8	19.72	1.89	8 46.0
19	14 30 5.64	0.529	13 32 9.9	1.91	0.669 5358	436.1	19.67	1.88	8 41.8
20	14 29 53.28	0.501	13 31 25.8	1.77	0.670 5896	442.1	19.62	1.88	8 37.7
21	14 29 41.60	-0.473	-13 30 45.0	+1.63	0.671 6577	+448.0	19.58	1.87	8 33.6
22	14 29 30.59	0.444	13 30 7.6	1.49	0.672 7396	453.6	19.53	1.87	8 29.5
23	14 29 20.27	0.416	13 29 33.5	1.35	0.673 8346	459.0	19.48	1.86	8 25.4
24	14 29 10.62	0.388	13 29 2.8	1.21	0.674 9424	464.2	19.43	1.86	8 21.3
25	14 29 1.66	0.359	13 28 35.5	1.07	0.676 0624	469.1	19.38	1.86	8 17.2
26	14 28 53.39	-0.330	-13 28 11.6	+0.92	0.677 1941	+473.9	19.33	1.85	8 13.2
27	14 28 45.82	0.301	13 27 51.1	0.78	0.678 3371	478.5	19.28	1.85	8 9.1
28	14 28 38.93	0.272	13 27 34.1	0.64	0.679 4908	482.9	19.23	1.84	8 5.1
29	14 28 32.74	0.244	13 27 20.5	0.49	0.680 6549	487.1	19.17	1.84	8 1.0
30	14 28 27.24	0.215	13 27 10.4	0.35	0.681 8289	491.1	19.12	1.83	7 57.0
July 1	14 28 22.44	-0.185	-13 27 3.7	+0.21	0.683 0122	+495.0	19.07	1.83	7 53.0
2	14 28 18.34	-0.156	-13 27 0.5	+0.06	0.684 2046	+498.6	19.02	1.82	7 49.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semidiameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
July	1	14 28	22.44	-0.185	-13 27	3.7		+0.21	0.683 0122	+495.0	19.07	1.83	7 53.0
	2	14 28	18.34	0.156	13 27	0.5		+0.06	0.684 2046	498.6	19.02	1.82	7 49.0
	3	14 28	14.94	0.127	13 27	0.7		-0.08	0.685 4055	502.1	18.97	1.82	7 45.0
	4	14 28	12.24	0.098	13 27	4.3		0.22	0.686 6146	505.4	18.91	1.81	7 41.1
	5	14 28	10.24	0.069	13 27	11.4		0.37	0.687 8313	508.5	18.86	1.81	7 37.1
	6	14 28	8.95	-0.039	-13 27	22.0		-0.51	0.689 0553	+511.5	18.81	1.80	7 33.1
	7	14 28	8.36	-0.010	13 27	36.0		0.66	0.690 2861	514.2	18.75	1.80	7 29.2
	8	14 28	8.47	+0.019	13 27	53.5		0.80	0.691 5232	516.7	18.70	1.79	7 25.3
	9	14 28	9.29	0.049	13 28	14.4		0.94	0.692 7661	519.0	18.65	1.79	7 21.4
	10	14 28	10.82	0.078	13 28	38.8		1.09	0.694 0145	521.2	18.59	1.78	7 17.5
	11	14 28	13.05	+0.107	-13 29	6.5		-1.23	0.695 2679	+523.2	18.54	1.78	7 13.6
	12	14 28	15.98	0.137	13 29	37.7		1.37	0.696 5259	525.0	18.49	1.77	7 9.7
	13	14 28	19.62	0.166	13 30	12.3		1.51	0.697 7880	526.7	18.43	1.76	7 5.8
	14	14 28	23.96	0.195	13 30	50.3		1.65	0.699 0538	528.1	18.38	1.76	7 2.0
	15	14 28	29.00	0.225	13 31	31.7		1.80	0.700 3229	529.4	18.33	1.75	6 58.1
	16	14 28	34.74	+0.254	-13 32	16.5		-1.94	0.701 5949	+530.5	18.27	1.75	6 54.3
	17	14 28	41.17	0.283	13 33	4.6		2.08	0.702 8692	531.4	18.22	1.74	6 50.5
	18	14 28	48.30	0.311	13 33	56.1		2.21	0.704 1456	532.2	18.16	1.74	6 46.6
	19	14 28	56.12	0.340	13 34	50.9		2.35	0.705 4235	532.7	18.11	1.73	6 42.8
	20	14 29	4.63	0.369	13 35	48.9		2.48	0.706 7026	533.1	18.06	1.73	6 39.1
	21	14 29	13.81	+0.397	-13 36	50.1		-2.62	0.707 9824	+533.4	18.00	1.72	6 35.3
	22	14 29	23.67	0.425	13 37	54.6		2.75	0.709 2626	533.4	17.95	1.72	6 31.5
	23	14 29	34.21	0.453	13 39	2.3		2.89	0.710 5428	533.4	17.90	1.71	6 27.8
	24	14 29	45.42	0.481	13 40	13.1		3.01	0.711 8226	533.2	17.85	1.71	6 24.0
	25	14 29	57.29	0.508	13 41	27.0		3.14	0.713 1019	532.9	17.79	1.70	6 20.3
	26	14 30	9.82	+0.536	-13 42	44.0		-3.27	0.714 3803	+532.4	17.74	1.70	6 16.6
	27	14 30	23.00	0.563	13 44	4.1		3.40	0.715 6574	531.8	17.69	1.69	6 12.9
	28	14 30	36.83	0.590	13 45	27.2		3.52	0.716 9330	531.1	17.64	1.69	6 9.2
	29	14 30	51.31	0.617	13 46	53.3		3.65	0.718 2068	530.3	17.59	1.68	6 5.5
	30	14 31	6.44	0.644	13 48	22.4		3.77	0.719 4784	529.4	17.53	1.68	6 1.8
	31	14 31	22.20	+0.670	-13 49	54.4		-3.89	0.720 7477	+528.3	17.48	1.67	5 58.1
Aug.	1	14 31	38.60	0.696	13 51	29.3		4.01	0.722 0142	527.1	17.43	1.67	5 54.5
	2	14 31	55.63	0.723	13 53	7.1		4.13	0.723 2777	525.8	17.38	1.66	5 50.8
	3	14 32	13.29	0.749	13 54	47.7		4.25	0.724 5380	524.4	17.33	1.66	5 47.2
	4	14 32	31.57	0.775	13 56	31.1		4.37	0.725 7948	522.9	17.28	1.66	5 43.6
	5	14 32	50.48	+0.800	-13 58	17.3		-4.48	0.727 0477	+521.2	17.23	1.65	5 39.9
	6	14 33	9.99	0.826	14 0	6.2		4.59	0.728 2966	519.5	17.18	1.65	5 36.3
	7	14 33	30.12	0.851	14 1	57.8		4.70	0.729 5411	517.6	17.13	1.64	5 32.7
	8	14 33	50.85	0.876	14 3	52.1		4.81	0.730 7809	515.6	17.08	1.64	5 29.2
	9	14 34	12.19	0.901	14 5	48.9		4.92	0.732 0159	513.5	17.04	1.63	5 25.6
	10	14 34	34.12	+0.926	-14 7	48.4		-5.03	0.733 2457	+511.3	16.99	1.63	5 22.0
	11	14 34	56.65	0.951	14 9	50.5		5.14	0.734 4701	509.0	16.94	1.62	5 18.4
	12	14 35	19.77	0.976	14 11	55.0		5.24	0.735 6887	506.5	16.89	1.62	5 14.9
	13	14 35	43.48	1.000	14 14	2.1		5.34	0.736 9013	504.0	16.84	1.61	5 11.4
	14	14 36	7.76	1.024	14 16	11.5		5.44	0.738 1077	501.3	16.80	1.61	5 7.8
	15	14 36	32.62	+1.048	-14 18	23.4		-5.55	0.739 3075	+498.5	16.75	1.60	5 4.3
	16	14 36	58.04	+1.071	-14 20	37.7		-5.64	0.740 5006	+495.7	16.71	1.60	5 0.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Aug. 16	14 36 58.04	+1.071	-14 20 37.7	-5.64	0.740 5006	+495.7	16.71	1.60	5 0.8
17	14 37 24.02	1.094	14 22 54.2	5.74	0.741 6868	492.7	16.66	1.60	4 57.3
18	14 37 50.55	1.117	14 25 13.0	5.83	0.742 8657	489.7	16.61	1.59	4 53.8
19	14 38 17.63	1.140	14 27 34.1	5.92	0.744 0373	486.6	16.57	1.59	4 50.3
20	14 38 45.26	1.162	14 29 57.3	6.01	0.745 2012	483.3	16.53	1.58	4 46.9
21	14 39 13.42	+1.184	-14 32 22.6	-6.10	0.746 3573	+480.1	16.48	1.58	4 43.4
22	14 39 42.10	1.206	14 34 50.0	6.19	0.747 5055	476.7	16.44	1.57	4 40.0
23	14 40 11.32	1.228	14 37 19.5	6.27	0.748 6454	473.2	16.40	1.57	4 36.5
24	14 40 41.05	1.249	14 39 51.0	6.35	0.749 7770	469.8	16.35	1.57	4 33.1
25	14 41 11.29	1.271	14 42 24.5	6.43	0.750 9002	466.2	16.31	1.56	4 29.6
26	14 41 42.04	+1.292	-14 44 59.8	-6.51	0.752 0148	+462.6	16.27	1.56	4 26.2
27	14 42 13.29	1.313	14 47 37.0	6.59	0.753 1207	459.0	16.23	1.55	4 22.8
28	14 42 45.04	1.333	14 50 16.1	6.66	0.754 2178	455.3	16.19	1.55	4 19.4
29	14 43 17.28	1.353	14 52 56.9	6.74	0.755 3058	451.4	16.15	1.55	4 16.0
30	14 43 50.00	1.374	14 55 39.5	6.81	0.756 3846	447.6	16.11	1.54	4 12.6
31	14 44 23.21	+1.394	-14 58 23.8	-6.88	0.757 4541	+443.7	16.07	1.54	4 9.2
Sept. 1	14 44 56.90	1.414	15 1 9.8	6.95	0.758 5142	439.7	16.03	1.54	4 5.9
2	14 45 31.07	1.433	15 3 57.4	7.02	0.759 5646	435.6	15.99	1.53	4 2.5
3	14 46 5.70	1.453	15 6 46.6	7.08	0.760 6052	431.5	15.95	1.53	3 59.1
4	14 46 40.80	1.472	15 9 37.4	7.15	0.761 6359	427.4	15.91	1.52	3 55.8
5	14 47 16.35	+1.491	-15 12 29.7	-7.21	0.762 6566	+423.1	15.87	1.52	3 52.5
6	14 47 52.36	1.510	15 15 23.5	7.27	0.763 6670	418.9	15.84	1.52	3 49.1
7	14 48 28.81	1.528	15 18 18.6	7.33	0.764 6671	414.5	15.80	1.51	3 45.8
8	14 49 5.72	1.547	15 21 15.2	7.39	0.765 6567	410.1	15.77	1.51	3 42.5
9	14 49 43.06	1.565	15 24 13.2	7.44	0.766 6356	405.6	15.73	1.51	3 39.2
10	14 50 20.84	+1.583	-15 27 12.5	-7.50	0.767 6037	+401.1	15.70	1.50	3 35.9
11	14 50 59.04	1.601	15 30 13.0	7.55	0.768 5608	396.5	15.66	1.50	3 32.6
12	14 51 37.67	1.618	15 33 14.8	7.60	0.769 5068	391.8	15.63	1.50	3 29.3
13	14 52 16.71	1.635	15 36 17.8	7.65	0.770 4415	387.1	15.59	1.49	3 26.0
14	14 52 56.17	1.652	15 39 21.9	7.69	0.771 3648	382.3	15.56	1.49	3 22.7
15	14 53 36.02	+1.669	-15 42 27.1	-7.74	0.772 2765	+377.5	15.53	1.49	3 19.5
16	14 54 16.28	1.685	15 45 33.4	7.78	0.773 1766	372.6	15.49	1.48	3 16.2
17	14 54 56.92	1.702	15 48 40.7	7.82	0.774 0650	367.7	15.46	1.48	3 12.9
18	14 55 37.96	1.718	15 51 49.0	7.86	0.774 9417	362.8	15.43	1.48	3 9.7
19	14 56 19.37	1.733	15 54 58.1	7.90	0.775 8064	357.8	15.40	1.48	3 6.4
20	14 57 1.16	+1.749	-15 58 8.1	-7.94	0.776 6593	+352.9	15.37	1.47	3 3.2
21	14 57 43.31	1.764	16 1 19.0	7.97	0.777 5002	347.9	15.34	1.47	3 0.0
22	14 58 25.83	1.779	16 4 30.6	8.00	0.778 3290	342.8	15.31	1.47	2 56.7
23	14 59 8.70	1.794	16 7 43.1	8.04	0.779 1457	337.7	15.28	1.46	2 53.5
24	14 59 51.93	1.809	16 10 56.3	8.06	0.779 9501	332.6	15.26	1.46	2 50.3
25	15 0 35.51	+1.823	-16 14 10.2	-8.09	0.780 7423	+327.5	15.23	1.46	2 47.1
26	15 1 19.44	1.837	16 17 24.8	8.12	0.781 5221	322.3	15.20	1.46	2 43.9
27	15 2 3.70	1.851	16 20 39.9	8.14	0.782 2895	317.1	15.17	1.45	2 40.7
28	15 2 48.30	1.865	16 23 55.6	8.16	0.783 0444	311.9	15.15	1.45	2 37.5
29	15 3 33.24	1.879	16 27 11.8	8.19	0.783 7868	306.7	15.12	1.45	2 34.3
30	15 4 18.50	+1.893	-16 30 28.6	-8.21	0.784 5166	+301.4	15.10	1.44	2 31.1
Oct. 1	15 5 4.08	+1.906	-16 33 45.8	-8.22	0.785 2336	+296.1	15.07	1.44	2 28.0

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"					h	m
Oct.	1	15	5	4.08	+1.906	−16	33	45.8	−8.22	0.785 2336	+296.1	15.07	1.44	2 28.0
	2	15	5	49.98	1.919	16	37	3.4	8.21	0.785 9379	290.8	15.05	1.44	2 24.8
	3	15	6	36.19	1.932	16	40	21.5	8.26	0.786 6293	285.4	15.02	1.44	2 21.6
	4	15	7	22.71	1.945	16	43	39.9	8.27	0.787 3077	280.0	15.00	1.44	2 18.5
	5	15	8	9.53	1.957	16	46	58.6	8.29	0.787 9731	274.5	14.98	1.43	2 15.3
	6	15	8	56.66	+1.970	−16	50	17.6	−8.30	0.788 6253	+269.0	14.95	1.43	2 12.2
	7	15	9	44.08	1.982	16	53	36.9	8.31	0.789 2643	263.5	14.93	1.43	2 9.0
	8	15	10	31.79	1.994	16	56	56.4	8.32	0.789 8900	257.9	14.91	1.43	2 5.9
	9	15	11	19.77	2.005	17	0	16.1	8.32	0.790 5022	252.3	14.89	1.43	2 2.7
	10	15	12	8.04	2.017	17	3	35.9	8.33	0.791 1009	246.6	14.87	1.42	1 59.6
	11	15	12	56.58	+2.028	−17	6	55.9	−8.33	0.791 6861	+241.0	14.85	1.42	1 56.5
	12	15	13	45.39	2.039	17	10	15.9	8.33	0.792 2577	235.3	14.83	1.42	1 53.4
	13	15	14	34.45	2.050	17	13	35.9	8.33	0.792 8155	229.6	14.81	1.42	1 50.2
	14	15	15	23.77	2.060	17	16	55.9	8.33	0.793 3597	223.9	14.79	1.42	1 47.1
	15	15	16	13.34	2.070	17	20	15.9	8.33	0.793 8901	218.1	14.77	1.41	1 44.0
	16	15	17	3.15	+2.080	−17	23	35.9	−8.33	0.794 4066	+212.3	14.76	1.41	1 40.9
	17	15	17	53.20	2.090	17	26	55.7	8.32	0.794 9093	206.6	14.74	1.41	1 37.8
	18	15	18	43.48	2.100	17	30	15.4	8.32	0.795 3981	200.8	14.72	1.41	1 34.7
	19	15	19	33.98	2.109	17	33	34.9	8.31	0.795 8729	194.9	14.71	1.41	1 31.6
	20	15	20	24.71	2.118	17	36	54.2	8.30	0.796 3338	189.1	14.69	1.41	1 28.5
	21	15	21	15.65	+2.127	−17	40	13.2	−8.29	0.796 7808	+183.4	14.68	1.41	1 25.4
	22	15	22	6.81	2.136	17	43	32.0	8.28	0.797 2140	177.6	14.66	1.40	1 22.4
	23	15	22	58.17	2.144	17	46	50.4	8.26	0.797 6331	171.7	14.65	1.40	1 19.3
	24	15	23	49.74	2.153	17	50	8.5	8.25	0.798 0383	165.9	14.63	1.40	1 16.2
	25	15	24	41.50	2.161	17	53	26.2	8.23	0.798 4293	160.0	14.62	1.40	1 13.1
	26	15	25	33.46	+2.169	−17	56	43.5	−8.21	0.798 8062	+154.1	14.61	1.40	1 10.1
	27	15	26	25.60	2.176	18	0	0.4	8.19	0.799 1689	148.2	14.59	1.40	1 7.0
	28	15	27	17.93	2.184	18	3	16.7	8.17	0.799 5175	142.3	14.58	1.40	1 3.9
	29	15	28	10.44	2.192	18	6	32.6	8.15	0.799 8518	136.4	14.57	1.40	1 0.9
	30	15	29	3.13	2.199	18	9	48.0	8.13	0.800 1720	130.5	14.56	1.39	0 57.8
31	15	29	55.99	+2.206	−18	13	2.9	−8.11	0.800 4780	+124.5	14.55	1.39	0 54.8	
Nov.	1	15	30	49.01	2.213	18	16	17.2	8.08	0.800 7696	118.5	14.54	1.39	0 51.7
	2	15	31	42.20	2.219	18	19	30.9	8.06	0.801 0468	112.5	14.53	1.39	0 48.7
	3	15	32	35.54	2.226	18	22	44.0	8.03	0.801 3096	106.5	14.52	1.39	0 45.6
	4	15	33	29.03	2.232	18	25	56.4	8.00	0.801 5578	100.4	14.51	1.39	0 42.6
	5	15	34	22.67	+2.238	−18	29	8.2	−7.97	0.801 7915	+ 94.3	14.51	1.39	0 39.5
	6	15	35	16.45	2.244	18	32	19.2	7.94	0.802 0106	88.2	14.50	1.39	0 36.5
	7	15	36	10.37	2.249	18	35	29.5	7.91	0.802 2150	82.1	14.49	1.39	0 33.5
	8	15	37	4.41	2.254	18	38	39.1	7.88	0.802 4047	76.0	14.49	1.39	0 30.4
	9	15	37	58.58	2.259	18	41	47.9	7.85	0.802 5797	69.8	14.48	1.39	0 27.4
	10	15	38	52.86	+2.264	−18	44	55.8	−7.81	0.802 7399	+ 63.7	14.48	1.39	0 24.4
	11	15	39	47.25	2.269	18	48	2.9	7.78	0.802 8853	57.5	14.47	1.39	0 21.3
	12	15	40	41.75	2.273	18	51	9.2	7.74	0.803 0160	51.4	14.47	1.39	0 18.3
	13	15	41	36.34	2.276	18	54	14.5	7.70	0.803 1319	45.2	14.46	1.38	0 15.3
	14	15	42	31.02	2.280	18	57	18.9	7.66	0.803 2330	39.0	14.46	1.38	0 12.2
	15	15	43	25.79	+2.284	−19	0	22.3	−7.62	0.803 3193	+ 32.9	14.46	1.38	0 9.2
	16	15	44	20.65	+2.287	−19	3	24.7	−7.58	0.803 3909	+ 26.7	14.45	1.38	0 6.2

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- ax.	Transit, Meridian of Green- wich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Nov. 16	15	44	20.65	+2.287	-19	3	24.7	-7.58	0.803 3909	+ 26.7	14.45	1.38	0 6.2
17	15	45	15.58	2.290	19	6	26.2	7.54	0.803 4476	20.6	14.45	1.38	0 3.2
18	15	46	10.57	2.293	19	9	26.6	7.49	0.803 4896	14.4	14.45	1.38	0 0.2
19	15	47	5.63	2.295	19	12	25.9	7.45	0.803 5168	8.3	14.45	1.38	23 57.1
20	15	48	0.75	2.298	19	15	24.2	7.41	0.803 5293	+ 2.1	14.45	1.38	23 54.1
21	15	48	55.93	+2.300	-19	18	21.4	-7.36	0.803 5271	- 4.0	14.45	1.38	23 51.1
22	15	49	51.16	2.302	19	21	17.5	7.31	0.803 5101	10.2	14.45	1.38	23 48.1
23	15	50	46.43	2.304	19	24	12.4	7.26	0.803 4783	16.3	14.45	1.38	23 45.1
24	15	51	41.74	2.305	19	27	6.2	7.22	0.803 4318	22.5	14.45	1.38	23 42.1
25	15	52	37.09	2.307	19	29	58.9	7.17	0.803 3704	28.7	14.45	1.38	23 39.1
26	15	53	32.46	+2.308	-19	32	50.3	-7.12	0.803 2942	- 34.8	14.46	1.38	23 36.0
27	15	54	27.86	2.309	19	35	40.5	7.07	0.803 2033	41.0	14.46	1.38	23 33.0
28	15	55	23.29	2.310	19	38	29.6	7.02	0.803 0975	47.2	14.46	1.38	23 30.0
29	15	56	18.72	2.310	19	41	17.4	6.96	0.802 9768	53.4	14.47	1.39	23 27.0
30	15	57	14.16	2.310	19	44	3.9	6.91	0.802 8413	59.6	14.47	1.39	23 24.0
Dec. 1	15	58	9.61	+2.310	-19	46	49.2	-6.86	0.802 6909	- 65.8	14.48	1.39	23 21.0
2	15	59	5.06	2.310	19	49	33.2	6.80	0.802 5255	72.0	14.48	1.39	23 18.0
3	16	0	0.49	2.309	19	52	15.8	6.75	0.802 3451	78.3	14.49	1.39	23 15.0
4	16	0	55.91	2.309	19	54	57.2	6.70	0.802 1498	81.5	14.50	1.39	23 11.9
5	16	1	51.31	2.308	19	57	37.2	6.61	0.801 9395	90.8	14.50	1.39	23 8.9
6	16	2	46.68	+2.306	-20	0	15.9	-6.58	0.801 7141	- 97.0	14.51	1.39	23 5.9
7	16	3	42.02	2.305	20	2	53.2	6.52	0.801 4737	103.3	14.52	1.39	23 2.9
8	16	4	37.31	2.303	20	5	29.1	6.47	0.801 2184	109.5	14.53	1.39	22 59.9
9	16	5	32.56	2.301	20	8	3.6	6.41	0.800 9480	115.8	14.54	1.39	22 56.9
10	16	6	27.75	2.298	20	10	36.7	6.35	0.800 6626	122.0	14.54	1.39	22 53.9
11	16	7	22.88	+2.296	-20	13	8.3	-6.29	0.800 3623	-128.2	14.55	1.39	22 50.8
12	16	8	17.94	2.293	20	15	38.5	6.23	0.800 0471	134.4	14.57	1.39	22 47.8
13	16	9	12.92	2.289	20	18	7.2	6.17	0.799 7170	140.6	14.58	1.40	22 44.8
14	16	10	7.82	2.286	20	20	34.5	6.10	0.799 3721	146.8	14.59	1.40	22 41.7
15	16	11	2.64	2.282	20	23	0.2	6.04	0.799 0123	153.0	14.60	1.40	22 38.7
16	16	11	57.35	+2.278	-20	25	24.5	-5.98	0.798 6378	-159.1	14.61	1.40	22 35.7
17	16	12	51.97	2.274	20	27	47.3	5.92	0.798 2485	165.3	14.63	1.40	22 32.7
18	16	13	46.48	2.269	20	30	8.5	5.85	0.797 8445	171.4	14.64	1.40	22 29.6
19	16	14	40.88	2.264	20	32	28.2	5.79	0.797 4258	177.5	14.65	1.40	22 26.6
20	16	15	35.16	2.259	20	34	46.4	5.72	0.796 9925	183.6	14.67	1.40	22 23.6
21	16	16	29.32	+2.254	-20	37	3.0	-5.66	0.796 5446	-189.7	14.68	1.41	22 20.5
22	16	17	23.35	2.249	20	39	18.0	5.59	0.796 0821	195.7	14.70	1.41	22 17.5
23	16	18	17.25	2.243	20	41	31.5	5.53	0.795 6051	201.8	14.71	1.41	22 14.5
24	16	19	11.00	2.237	20	43	43.4	5.46	0.795 1135	207.9	14.73	1.41	22 11.4
25	16	20	4.61	2.230	20	45	53.8	5.40	0.794 6074	213.9	14.75	1.41	22 8.4
26	16	20	58.06	+2.224	-20	48	2.6	-5.34	0.794 0868	-219.9	14.77	1.41	22 5.4
27	16	21	51.35	2.217	20	50	9.9	5.27	0.793 5517	226.0	14.78	1.42	22 2.3
28	16	22	44.48	2.210	20	52	15.5	5.20	0.793 0021	232.0	14.80	1.42	21 59.3
29	16	23	37.44	2.203	20	54	19.5	5.14	0.792 4380	238.0	14.82	1.42	21 56.2
30	16	24	30.22	2.195	20	56	22.0	5.07	0.791 8595	244.1	14.84	1.42	21 53.2
31	16	25	22.81	+2.187	-20	58	22.9	-5.00	0.791 2665	-250.1	14.86	1.42	21 50.1
32	16	26	15.21	...	-21	0	22.2	...	0.790 6591	...	14.88	1.42	21 47.0

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	" "	"	° ' "	"		
Jan.	2	214 40 40.5	4 33.84	-20.6	+1 11 10.5	-2.64	0.735 3374	-101.4
	6	214 58 55.9	4 33.89	20.7	1 10 59.9	2.66	0.735 2966	102.8
	10	215 17 11.6	4 33.94	20.9	1 10 49.2	2.70	0.735 2552	104.2
	14	215 35 27.4	4 33.99	21.1	1 10 38.3	2.74	0.735 2132	105.6
	18	215 53 43.5	4 34.05	21.3	1 10 27.3	2.76	0.735 1707	107.0
	22	216 11 59.8	4 34.10	-21.5	+1 10 16.2	-2.80	0.735 1276	-108.5
	26	216 30 16.3	4 34.15	21.6	1 10 4.9	2.84	0.735 0839	109.9
	30	216 48 33.0	4 34.21	21.8	1 9 53.5	2.86	0.735 0397	111.4
	3	217 6 50.0	4 34.26	22.0	1 9 42.0	2.89	0.734 9948	112.9
	7	217 25 7.1	4 34.31	22.1	1 9 30.4	2.92	0.734 9494	114.3
Feb.	11	217 43 24.5	4 34.38	-22.3	+1 9 18.6	-2.95	0.734 9034	-115.6
	15	218 1 42.2	4 34.44	22.4	1 9 6.8	2.98	0.734 8569	117.0
	19	218 20 0.0	4 34.49	22.6	1 8 54.8	3.00	0.734 8098	118.5
	23	218 38 18.1	4 34.56	22.8	1 8 42.8	3.03	0.734 7621	120.0
	27	218 56 36.5	4 34.62	22.9	1 8 30.6	3.06	0.734 7138	121.4
	3	219 14 55.1	4 34.68	-23.0	+1 8 18.3	-3.10	0.734 6650	-122.9
	7	219 33 13.9	4 34.74	23.2	1 8 5.8	3.13	0.734 6155	124.3
	11	219 51 33.0	4 34.80	23.3	1 7 53.3	3.15	0.734 5655	125.6
Mar.	15	220 9 52.3	4 34.86	23.5	1 7 40.6	3.19	0.734 5150	127.0
	19	220 28 11.9	4 34.92	23.6	1 7 27.8	3.21	0.734 4639	128.5
	23	220 46 31.7	4 34.99	-23.7	+1 7 14.9	-3.24	0.734 4122	-130.0
	27	221 4 51.8	4 35.06	23.9	1 7 1.9	3.27	0.734 3599	131.4
	31	221 23 12.2	4 35.12	24.0	1 6 48.7	3.30	0.734 3071	132.6
	4	221 41 32.8	4 35.19	24.1	1 6 35.5	3.33	0.734 2538	134.0
	8	221 59 53.7	4 35.26	24.3	1 6 22.1	3.36	0.734 1999	135.5
	12	222 18 14.9	4 35.32	-24.4	+1 6 8.6	-3.39	0.734 1454	-136.9
	16	222 36 36.3	4 35.39	24.5	1 5 55.0	3.41	0.734 0904	138.3
	20	222 54 58.0	4 35.46	24.6	1 5 41.3	3.44	0.734 0348	139.6
Apr.	24	223 13 20.0	4 35.54	24.7	1 5 27.5	3.48	0.733 9787	141.0
	28	223 31 42.3	4 35.60	24.8	1 5 13.5	3.51	0.733 9220	142.4
	2	223 50 4.8	4 35.67	-24.9	+1 4 59.4	-3.53	0.733 8648	-143.8
	6	224 8 27.6	4 35.75	25.1	1 4 45.3	3.56	0.733 8070	145.1
	10	224 26 50.8	4 35.83	25.2	1 4 31.0	3.60	0.733 7487	146.5
	14	224 45 14.2	4 35.89	25.3	1 4 16.5	3.63	0.733 6898	147.9
	18	225 3 37.9	4 35.96	25.4	1 4 2.0	3.65	0.733 6304	149.3
	22	225 22 1.9	4 36.04	-25.4	+1 3 47.3	-3.68	0.733 5704	-150.6
	26	225 40 26.2	4 36.11	25.5	1 3 32.6	3.70	0.733 5099	151.9
	30	225 58 50.8	4 36.20	25.6	1 3 17.7	3.74	0.733 4489	153.3
June	3	226 17 15.8	4 36.28	25.7	1 3 2.7	3.77	0.733 3873	154.7
	7	226 35 41.0	4 36.35	25.8	1 2 47.5	3.80	0.733 3251	156.0
	11	226 54 6.6	4 36.42	-25.9	+1 2 32.3	-3.82	0.733 2625	-157.3
	15	227 12 32.4	4 36.50	26.0	1 2 17.0	3.85	0.733 1993	158.6
	19	227 30 58.6	4 36.59	26.0	1 2 1.5	3.87	0.733 1356	160.0
	23	227 49 25.1	4 36.68	26.1	1 1 46.0	3.89	0.733 0713	161.3
	27	228 7 52.0	4 36.76	26.2	1 1 30.4	3.92	0.733 0066	162.6
	1	228 26 19.2	4 36.83	-26.2	+1 1 14.6	-3.95	0.732 9413	-163.9
July	5	228 44 46.6	4 36.90	-26.3	+1 0 58.8	-3.98	0.732 8755	-165.2

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	"	° ' "	"		
July	1	228 26 19.2	4 36.83	-26.2	+1 1 14.6	-3.95	0.732 9413	-163.9
	5	228 44 46.6	4 36.90	26.3	1 0 58.8	3.98	0.732 8755	165.2
	9	229 3 14.4	4 37.00	26.3	1 0 42.8	4.01	0.732 8091	166.6
	13	229 21 42.6	4 37.09	26.4	1 0 26.7	4.04	0.732 7422	167.9
	17	229 40 11.1	4 37.16	26.4	1 0 10.5	4.07	0.732 6748	169.1
	21	229 58 39.9	4 37.25	-26.5	+0 59 54.1	-4.10	0.732 6069	-170.5
Aug.	25	230 17 9.1	4 37.34	26.5	0 59 37.7	4.11	0.732 5384	171.8
	29	230 35 38.6	4 37.42	26.6	0 59 21.2	4.14	0.732 4695	173.0
	2	230 54 8.5	4 37.51	26.6	0 59 4.6	4.17	0.732 4000	174.4
	6	231 12 38.7	4 37.60	26.7	0 58 47.8	4.20	0.732 3300	175.6
	10	231 31 9.3	4 37.69	-26.7	+0 58 31.0	-4.23	0.732 2595	-176.9
	14	231 49 40.2	4 37.78	26.7	0 58 14.0	4.26	0.732 1885	178.3
	18	232 8 11.5	4 37.87	26.8	0 57 56.9	4.29	0.732 1169	179.6
	22	232 26 43.2	4 37.96	26.8	0 57 39.7	4.30	0.732 0448	180.8
	26	232 45 15.2	4 38.05	26.8	0 57 22.5	4.33	0.731 9723	182.0
	30	233 3 47.6	4 38.14	-26.8	+0 57 5.1	-4.36	0.731 8992	-183.3
	3	233 22 20.3	4 38.24	26.8	0 56 47.6	4.39	0.731 8256	184.5
	7	233 40 53.5	4 38.34	26.8	0 56 30.0	4.42	0.731 7516	185.8
Sept.	11	233 59 27.0	4 38.43	26.8	0 56 12.2	4.45	0.731 6770	187.0
	15	234 18 0.9	4 38.52	26.8	0 55 54.4	4.46	0.731 6020	188.3
	19	234 36 35.2	4 38.61	-26.8	+0 55 36.5	-4.49	0.731 5264	-189.5
	23	234 55 9.8	4 38.71	26.8	0 55 18.5	4.51	0.731 4504	190.8
	27	235 13 44.9	4 38.81	26.8	0 55 0.4	4.55	0.731 3738	192.1
	1	235 32 20.3	4 38.90	26.8	0 54 42.1	4.57	0.731 2967	193.3
Oct.	5	235 50 56.1	4 39.01	26.8	0 54 23.8	4.59	0.731 2192	194.5
	9	236 9 32.4	4 39.11	-26.8	+0 54 5.4	-4.62	0.731 1411	-195.7
	13	236 28 9.0	4 39.20	26.8	0 53 46.8	4.65	0.731 0626	196.9
	17	236 46 46.0	4 39.30	26.8	0 53 28.2	4.66	0.730 9836	198.1
	21	237 5 23.4	4 39.41	26.8	0 53 9.5	4.70	0.730 9041	199.3
	25	237 24 1.3	4 39.52	26.7	0 52 50.6	4.73	0.730 8242	200.4
Nov.	29	237 42 39.6	4 39.62	-26.7	+0 52 31.7	-4.75	0.730 7438	-201.7
	2	238 1 18.3	4 39.71	26.7	0 52 12.6	4.77	0.730 6628	203.0
	6	238 19 57.3	4 39.81	26.6	0 51 53.5	4.79	0.730 5814	204.1
	10	238 38 36.8	4 39.93	26.6	0 51 34.3	4.81	0.730 4995	205.3
	14	238 57 16.8	4 40.04	26.6	0 51 15.0	4.85	0.730 4172	206.5
	18	239 15 57.1	4 40.13	-26.5	+0 50 55.5	-4.88	0.730 3343	-207.7
Dec.	22	239 34 37.8	4 40.24	26.5	0 50 36.0	4.89	0.730 2510	208.8
	26	239 53 19.0	4 40.35	26.4	0 50 16.4	4.92	0.730 1673	209.9
	30	240 12 0.6	4 40.46	26.4	0 49 56.6	4.95	0.730 0831	211.1
	4	240 30 42.7	4 40.57	26.3	0 49 36.8	4.96	0.729 9984	212.4
	8	240 49 25.2	4 40.68	-26.2	+0 49 16.9	-4.99	0.729 9132	-213.5
	12	241 8 8.1	4 40.78	26.2	0 48 56.9	5.02	0.729 8276	214.5
	16	241 26 51.4	4 40.89	26.1	0 48 36.7	5.05	0.729 7416	215.7
	20	241 45 35.2	4 41.00	26.0	0 48 16.5	5.06	0.729 6550	216.9
	24	242 4 19.4	4 41.11	26.0	0 47 56.2	5.09	0.729 5681	218.0
	28	242 23 4.1	4 41.24	-25.9	+0 47 35.8	-5.11	0.729 4806	-219.1
	32	242 41 49.3	4 41.34	-25.8	+0 47 15.3	-5.13	0.729 3928	-220.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	h	m	s		°	'	"							h	m
Jan.	1	13	15	19.83	+0.472	-5	20	58.7	-2.16	0.988 3183	-301.8	7.66	0.90	18 32.0
	2	13	15	30.98	0.457	5	21	49.3	2.06	0.987 5853	306.1	7.67	0.91	18 28.2
	3	13	15	41.78	0.442	5	22	37.7	1.97	0.986 8492	307.3	7.69	0.91	18 24.5
	4	13	15	52.22	0.427	5	23	23.7	1.87	0.986 1103	308.5	7.70	0.91	18 20.7
	5	13	16	2.29	0.412	5	24	7.5	1.77	0.985 3686	309.5	7.71	0.91	18 16.9
	6	13	16	11.99	+0.397	-5	24	48.9	-1.68	0.984 6245	-310.5	7.73	0.91	18 13.1
	7	13	16	21.33	0.381	5	25	28.0	1.58	0.983 8780	311.5	7.74	0.91	18 9.4
	8	13	16	30.29	0.366	5	26	4.7	1.48	0.983 1295	312.3	7.75	0.92	18 5.6
	9	13	16	38.88	0.350	5	26	39.1	1.38	0.982 3790	313.1	7.77	0.92	18 1.8
	10	13	16	47.09	0.334	5	27	11.1	1.29	0.981 6268	313.7	7.78	0.92	17 58.0
	11	13	16	54.92	+0.318	-5	27	40.8	-1.19	0.980 8731	-314.3	7.79	0.92	17 54.2
	12	13	17	2.37	0.302	5	28	8.0	1.09	0.980 1181	314.8	7.81	0.92	17 50.4
	13	13	17	9.44	0.286	5	28	32.9	0.99	0.979 3620	315.2	7.82	0.92	17 46.6
	14	13	17	16.12	0.270	5	28	55.3	0.88	0.978 6051	315.5	7.83	0.92	17 42.7
	15	13	17	22.41	0.254	5	29	15.3	0.79	0.977 8476	315.7	7.85	0.93	17 38.9
	16	13	17	28.30	+0.237	-5	29	33.0	-0.69	0.977 0898	-315.8	7.86	0.93	17 35.1
	17	13	17	33.80	0.221	5	29	48.2	0.58	0.976 3318	315.8	7.88	0.93	17 31.2
	18	13	17	38.91	0.205	5	30	1.0	0.48	0.975 5741	315.6	7.89	0.93	17 27.4
	19	13	17	43.62	0.188	5	30	11.4	0.38	0.974 8168	315.4	7.90	0.93	17 23.5
	20	13	17	47.94	0.172	5	30	19.3	0.28	0.974 0602	315.0	7.92	0.93	17 19.6
	21	13	17	51.86	+0.155	-5	30	24.8	-0.18	0.973 3046	-314.6	7.93	0.94	17 15.8
	22	13	17	55.37	0.138	5	30	27.9	-0.08	0.972 5501	314.1	7.94	0.94	17 11.9
	23	13	17	58.49	0.121	5	30	28.6	+0.02	0.971 7970	313.4	7.96	0.94	17 8.0
	24	13	18	1.20	0.105	5	30	26.9	0.12	0.971 0456	312.7	7.97	0.94	17 4.1
	25	13	18	3.52	0.088	5	30	22.8	0.22	0.970 2961	311.8	7.98	0.94	17 0.2
	26	13	18	5.44	+0.072	-5	30	16.3	+0.32	0.969 5488	-310.9	8.00	0.94	16 56.3
	27	13	18	6.96	0.055	5	30	7.4	0.42	0.968 8039	309.8	8.01	0.95	16 52.4
	28	13	18	8.09	0.039	5	29	56.1	0.52	0.968 0617	308.6	8.03	0.95	16 48.5
	29	13	18	8.81	0.022	5	29	42.5	0.62	0.967 3224	307.4	8.04	0.95	16 44.5
	30	13	18	9.14	+0.005	5	29	26.5	0.72	0.966 5862	306.0	8.05	0.95	16 40.6
Feb.	31	13	18	9.07	-0.011	-5	29	8.1	+0.81	0.965 8534	-304.6	8.07	0.95	16 36.7
	1	13	18	8.61	0.027	5	28	47.4	0.91	0.965 1242	303.0	8.08	0.95	16 32.8
	2	13	18	7.75	0.044	5	28	24.4	1.01	0.964 3989	301.4	8.09	0.96	16 28.8
	3	13	18	6.49	0.061	5	27	59.0	1.11	0.963 6777	299.6	8.11	0.96	16 24.8
	4	13	18	4.84	0.077	5	27	31.3	1.20	0.962 9609	297.7	8.12	0.96	16 20.9
	5	13	18	2.79	-0.094	-5	27	1.3	+1.30	0.962 2487	-295.7	8.14	0.96	16 16.9
	6	13	18	0.35	0.110	5	26	29.0	1.39	0.961 5413	293.7	8.15	0.96	16 12.9
	7	13	17	57.52	0.126	5	25	54.4	1.49	0.960 8390	291.5	8.16	0.96	16 9.0
	8	13	17	54.30	0.142	5	25	17.5	1.58	0.960 1421	289.2	8.17	0.96	16 5.0
	9	13	17	50.68	0.159	5	24	38.4	1.67	0.959 4509	286.8	8.19	0.97	16 1.0
	10	13	17	46.68	-0.175	-5	23	57.1	+1.77	0.958 7656	-284.2	8.20	0.97	15 57.0
	11	13	17	42.30	0.191	5	23	13.5	1.86	0.958 0865	281.6	8.21	0.97	15 52.9
	12	13	17	37.53	0.207	5	22	27.7	1.95	0.957 4139	278.9	8.23	0.97	15 48.9
	13	13	17	32.37	0.223	5	21	39.8	2.04	0.956 7480	276.0	8.24	0.97	15 44.9
	14	13	17	26.84	0.238	5	20	49.7	2.13	0.956 0892	273.0	8.25	0.97	15 40.9
	15	13	17	20.93	-0.254	-5	19	57.5	+2.22	0.955 4377	-269.9	8.26	0.98	15 36.9
16	13	17	14.65	-0.269	-5	19	3.1	+2.31	0.954 7938	-266.7	8.27	0.98	15 32.8	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
Feb. 16	13 17 14.65	-0.269	-5 19 3.1	+2.31	0.954 7938	-266.7	8.27	0.98	15 32.8
17	13 17 8.00	0.285	5 18 6.7	2.39	0.954 1577	263.3	8.29	0.98	15 28.8
18	13 17 0.99	0.300	5 17 8.2	2.48	0.953 5298	259.9	8.30	0.98	15 24.7
19	13 16 53.61	0.315	5 16 7.7	2.56	0.952 9102	256.4	8.31	0.98	15 20.7
20	13 16 45.88	0.330	5 15 5.2	2.65	0.952 2993	252.7	8.32	0.98	15 16.6
21	13 16 37.79	-0.344	-5 14 0.7	+2.73	0.951 6972	-249.0	8.33	0.98	15 12.5
22	13 16 29.35	0.359	5 12 54.4	2.80	0.951 1043	245.1	8.35	0.98	15 8.4
23	13 16 20.57	0.373	5 11 46.1	2.88	0.950 5208	241.1	8.36	0.99	15 4.3
24	13 16 11.46	0.387	5 10 36.0	2.96	0.949 9469	237.1	8.37	0.99	15 0.3
25	13 16 2.01	0.400	5 9 24.0	3.04	0.949 3829	232.9	8.38	0.99	14 56.2
26	13 15 52.24	-0.414	-5 8 10.3	+3.11	0.948 8289	-228.7	8.39	0.99	14 52.1
27	13 15 42.14	0.427	5 6 54.8	3.18	0.948 2852	224.4	8.40	0.99	14 48.0
28	13 15 31.73	0.440	5 5 37.6	3.25	0.947 7520	219.9	8.41	0.99	14 43.9
Mar. 1	13 15 21.01	0.453	5 4 18.7	3.32	0.947 2296	215.4	8.42	0.99	14 39.8
2	13 15 9.98	0.466	5 2 58.2	3.39	0.946 7181	210.8	8.43	1.00	14 35.6
3	13 14 58.65	-0.478	-5 1 36.1	+3.45	0.946 2178	-206.1	8.44	1.00	14 31.5
4	13 14 47.02	0.490	5 0 12.5	3.52	0.945 7288	201.3	8.45	1.00	14 27.4
5	13 14 35.11	0.502	4 58 47.3	3.58	0.945 2513	196.5	8.46	1.00	14 23.3
6	13 14 22.91	0.514	4 57 20.6	3.64	0.944 7856	191.5	8.47	1.00	14 19.1
7	13 14 10.44	0.525	4 55 52.5	3.70	0.944 3319	186.5	8.48	1.00	14 15.0
8	13 13 57.69	-0.536	-4 54 23.0	+3.76	0.943 8903	-181.4	8.49	1.00	14 10.8
9	13 13 44.68	0.547	4 52 52.1	3.81	0.943 4610	176.2	8.49	1.00	14 6.7
10	13 13 31.42	0.558	4 51 19.9	3.87	0.943 0443	171.0	8.50	1.00	14 2.5
11	13 13 17.90	0.569	4 49 46.4	3.92	0.942 6404	165.6	8.51	1.00	13 58.4
12	13 13 4.13	0.579	4 48 11.7	3.97	0.942 2495	160.1	8.52	1.00	13 54.2
13	13 12 50.13	-0.588	-4 46 35.9	+4.01	0.941 8717	-154.6	8.52	1.01	13 50.1
14	13 12 35.89	0.598	4 44 59.0	4.06	0.941 5073	149.0	8.53	1.01	13 45.9
15	13 12 21.44	0.607	4 43 21.0	4.11	0.941 1565	143.3	8.54	1.01	13 41.7
16	13 12 6.77	0.615	4 41 41.9	4.15	0.940 8194	137.6	8.55	1.01	13 37.5
17	13 11 51.90	0.624	4 40 1.9	4.19	0.940 4962	131.8	8.55	1.01	13 33.3
18	13 11 36.83	-0.632	-4 38 21.0	+4.22	0.940 1870	-125.9	8.56	1.01	13 29.2
19	13 11 21.57	0.640	4 36 39.3	4.26	0.939 8919	120.0	8.56	1.01	13 25.0
20	13 11 6.13	0.647	4 34 56.7	4.29	0.939 6112	114.0	8.57	1.01	13 20.8
21	13 10 50.52	0.654	4 33 13.4	4.32	0.939 3449	107.9	8.57	1.01	13 16.6
22	13 10 34.75	0.660	4 31 29.4	4.35	0.939 0931	101.9	8.58	1.01	13 12.4
23	13 10 18.83	-0.666	-4 29 44.8	+4.37	0.938 8560	-95.7	8.58	1.01	13 8.2
24	13 10 2.76	0.672	4 27 59.6	4.39	0.938 6336	89.6	8.59	1.01	13 4.0
25	13 9 46.56	0.677	4 26 13.9	4.41	0.938 4261	83.4	8.59	1.01	12 59.8
26	13 9 30.24	0.682	4 24 27.8	4.43	0.938 2335	77.1	8.60	1.02	12 55.6
27	13 9 13.80	0.687	4 22 41.3	4.45	0.938 0559	70.9	8.60	1.02	12 51.4
28	13 8 57.25	-0.692	-4 20 54.4	+4.46	0.937 8934	-64.6	8.60	1.02	12 47.2
29	13 8 40.60	0.696	4 19 7.2	4.47	0.937 7460	58.3	8.61	1.02	12 43.0
30	13 8 23.86	0.699	4 17 19.8	4.48	0.937 6137	52.0	8.61	1.02	12 38.8
31	13 8 7.04	0.702	4 15 32.3	4.48	0.937 4966	45.6	8.61	1.02	12 34.6
Apr. 1	13 7 50.15	0.705	4 13 44.6	4.49	0.937 3946	39.3	8.61	1.02	12 30.4
2	13 7 33.20	-0.708	-4 11 56.8	+4.49	0.937 3078	-33.0	8.62	1.02	12 26.1
3	13 7 16.19	-0.710	-4 10 9.1	+4.49	0.937 2363	-26.6	8.62	1.02	12 21.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	
	h	m	s	s	°	'	"	"			"	"	h m
Apr.	1	13	7 50.15	-0.705	-4	13	44.6	+4.49	0.937 3946	-39.3	8.61	1.02	12 30.4
	2	13	7 33.20	0.708	4	11	56.8	4.49	0.937 3078	33.0	8.62	1.02	12 26.1
	3	13	7 16.19	0.710	4	10	9.1	4.49	0.937 2363	26.6	8.62	1.02	12 21.9
	4	13	6 59.13	0.712	4	8	21.4	4.49	0.937 1802	20.2	8.62	1.02	12 17.7
	5	13	6 42.03	0.713	4	6	33.8	4.48	0.937 1394	13.8	8.62	1.02	12 13.5
	6	13	6 24.91	-0.714	-4	4	46.4	+4.47	0.937 1141	-7.4	8.62	1.02	12 9.3
	7	13	6 7.76	0.715	4	2	59.2	4.46	0.937 1041	-0.9	8.62	1.02	12 5.1
	8	13	5 50.61	0.715	4	1	12.2	4.45	0.937 1096	+5.5	8.62	1.02	12 0.8
	9	13	5 33.45	0.715	3	59	25.5	4.44	0.937 1305	11.9	8.62	1.02	11 56.6
	10	13	5 16.30	0.714	3	57	39.3	4.42	0.937 1669	18.4	8.62	1.02	11 52.4
	11	13	4 59.16	-0.714	-3	55	53.4	+4.40	0.937 2186	+24.8	8.62	1.02	11 48.2
	12	13	4 42.05	0.712	3	54	8.1	4.38	0.937 2858	31.2	8.62	1.02	11 44.0
	13	13	4 24.98	0.710	3	52	23.3	4.35	0.937 3683	37.6	8.61	1.02	11 39.8
	14	13	4 7.95	0.708	3	50	39.2	4.32	0.937 4661	43.9	8.61	1.02	11 35.6
	15	13	3 50.98	0.706	3	48	55.7	4.29	0.937 5792	50.3	8.61	1.02	11 31.3
	16	13	3 34.07	-0.703	-3	47	13.0	+4.26	0.937 7074	+56.6	8.61	1.02	11 27.1
	17	13	3 17.23	0.700	3	45	31.0	4.23	0.937 8508	62.9	8.60	1.02	11 22.9
	18	13	3 0.48	0.696	3	43	49.9	4.20	0.938 0092	69.1	8.60	1.02	11 18.7
	19	13	2 43.82	0.692	3	42	9.6	4.16	0.938 1825	75.3	8.60	1.02	11 14.5
	20	13	2 27.26	0.688	3	40	30.4	4.11	0.938 3707	81.5	8.59	1.01	11 10.3
	21	13	2 10.81	-0.683	-3	38	52.2	+4.07	0.938 5737	+87.6	8.59	1.01	11 6.1
	22	13	1 54.47	0.678	3	37	15.0	4.03	0.938 7914	93.7	8.59	1.01	11 1.9
	23	13	1 38.27	0.672	3	35	38.9	3.98	0.939 0236	99.7	8.58	1.01	10 57.7
	24	13	1 22.20	0.666	3	34	3.9	3.93	0.939 2701	105.7	8.58	1.01	10 53.5
	25	13	1 6.28	0.660	3	32	30.2	3.88	0.939 5308	111.6	8.57	1.01	10 49.3
	26	13	0 50.50	-0.654	-3	30	57.7	+3.83	0.939 8056	+117.4	8.57	1.01	10 45.1
	27	13	0 34.89	0.647	3	29	26.5	3.77	0.940 0944	123.2	8.56	1.01	10 40.9
	28	13	0 19.45	0.640	3	27	56.7	3.71	0.940 3970	128.9	8.55	1.01	10 36.7
	29	13	0 4.18	0.633	3	26	28.2	3.66	0.940 7132	134.6	8.55	1.01	10 32.5
	30	12	59 49.09	0.625	3	25	1.2	3.59	0.941 0429	140.1	8.54	1.01	10 28.4
May	1	12	59 34.19	-0.617	-3	23	35.7	+3.53	0.941 3859	+145.6	8.53	1.01	10 24.2
	2	12	59 19.49	0.608	3	22	11.7	3.47	0.941 7420	151.1	8.53	1.01	10 20.0
	3	12	59 4.99	0.600	3	20	49.3	3.40	0.942 1111	156.5	8.52	1.00	10 15.9
	4	12	58 50.69	0.591	3	19	28.4	3.34	0.942 4931	161.8	8.51	1.00	10 11.7
	5	12	58 36.60	0.582	3	18	9.1	3.27	0.942 8877	167.0	8.50	1.00	10 7.5
	6	12	58 22.74	-0.573	-3	16	51.5	+3.20	0.943 2949	+172.2	8.50	1.00	10 3.3
	7	12	58 9.11	0.563	3	15	35.6	3.13	0.943 7144	177.3	8.49	1.00	9 59.2
	8	12	57 55.71	0.553	3	14	21.4	3.05	0.944 1461	182.4	8.48	1.00	9 55.0
	9	12	57 42.55	0.543	3	13	9.0	2.98	0.944 5898	187.4	8.47	1.00	9 50.9
	10	12	57 29.64	0.533	3	11	58.4	2.90	0.945 0454	192.3	8.46	1.00	9 46.7
	11	12	57 16.99	-0.522	-3	10	49.7	+2.82	0.945 5128	+197.1	8.45	1.00	9 42.6
	12	12	57 4.60	0.511	3	9	42.9	2.74	0.945 9916	201.8	8.44	1.00	9 38.5
	13	12	56 52.48	0.499	3	8	38.0	2.66	0.946 4816	206.5	8.43	1.00	9 34.3
	14	12	56 40.64	0.488	3	7	35.1	2.58	0.946 9826	211.0	8.42	0.99	9 30.2
	15	12	56 29.08	0.476	3	6	34.1	2.50	0.947 4943	215.4	8.41	0.99	9 26.1
	16	12	56 17.80	-0.464	-3	5	35.2	+2.41	0.948 0166	+219.8	8.40	0.99	9 22.0
	17	12	56 6.81	-0.452	-3	4	38.3	+2.33	0.948 5492	+224.0	8.39	0.99	9 17.9

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									Noon.
	h	m	s	s	°	'	"	"			"	"	h	m
May	17	12	56	6.81	-0.452	-3	4	38.3	+2.33	0.948 5492	+224.0	8.39	0.99	9 17.9
	18	12	55	56.11	0.439	3	3	43.5	2.24	0.949 0919	228.2	8.38	0.99	9 13.8
	19	12	55	45.72	0.427	3	2	50.8	2.15	0.949 6446	232.3	8.37	0.99	9 9.7
	20	12	55	35.63	0.414	3	2	0.2	2.06	0.950 2070	236.3	8.36	0.99	9 5.
	21	12	55	25.85	0.401	3	1	11.8	1.97	0.950 7787	240.1	8.35	0.99	9 1.5
	22	12	55	16.39	-0.388	-3	0	25.5	+1.88	0.951 3595	+243.9	8.34	0.98	8 57.4
	23	12	55	7.25	0.374	2	59	41.4	1.79	0.951 9492	247.5	8.33	0.98	8 53.3
	24	12	54	58.42	0.361	2	58	59.6	1.70	0.952 5474	251.0	8.32	0.98	8 49.2
	25	12	54	49.92	0.347	2	58	19.9	1.61	0.953 1540	254.4	8.31	0.98	8 45.2
	26	12	54	41.75	0.333	2	57	42.5	1.51	0.953 7687	257.8	8.29	0.98	8 41.1
	27	12	54	33.92	-0.319	-2	57	7.3	+1.42	0.954 3913	+261.0	8.28	0.98	8 37.0
June	28	12	54	26.42	0.305	2	56	34.4	1.32	0.955 0215	264.1	8.27	0.98	8 33.0
	29	12	54	19.26	0.291	2	56	3.8	1.23	0.955 6591	267.2	8.26	0.98	8 28.9
	30	12	54	12.43	0.277	2	55	35.5	1.13	0.956 3040	270.1	8.24	0.97	8 24.9
	31	12	54	5.94	0.263	2	55	9.4	1.04	0.956 9558	273.0	8.23	0.97	8 20.9
	1	12	53	59.80	-0.249	-2	54	45.7	+0.94	0.957 6144	+275.8	8.22	0.97	8 16.8
	2	12	53	54.01	0.234	2	54	24.3	0.84	0.958 2796	278.5	8.21	0.97	8 12.8
	3	12	53	48.57	0.220	2	54	5.3	0.75	0.958 9510	281.0	8.20	0.97	8 8.8
	4	12	53	43.47	0.205	2	53	48.5	0.65	0.959 6285	283.5	8.18	0.97	8 4.7
	5	12	53	38.73	0.190	2	53	34.1	0.55	0.960 3119	285.9	8.17	0.96	8 0.7
	6	12	53	34.35	-0.175	-2	53	22.1	+0.45	0.961 0009	+288.2	8.16	0.96	7 56.7
	7	12	53	30.32	0.160	2	53	12.4	0.35	0.961 6953	290.4	8.14	0.96	7 52.7
July	8	12	53	26.65	0.145	2	53	5.1	0.25	0.962 3950	292.6	8.13	0.96	7 48.8
	9	12	53	23.35	0.130	2	53	0.2	0.16	0.963 0996	294.6	8.12	0.96	7 44.8
	10	12	53	20.41	0.115	2	52	57.6	+0.06	0.963 8089	296.5	8.11	0.96	7 40.8
	11	12	53	17.84	-0.100	-2	52	57.4	-0.04	0.964 5226	+298.3	8.09	0.96	7 36.8
	12	12	53	15.63	0.084	2	52	59.6	0.14	0.965 2405	300.0	8.08	0.95	7 32.9
	13	12	53	13.79	0.069	2	53	4.2	0.24	0.965 9624	301.5	8.06	0.95	7 28.9
	14	12	53	12.32	0.054	2	53	11.2	0.34	0.966 6879	303.0	8.05	0.95	7 25.0
	15	12	53	11.22	0.038	2	53	20.5	0.44	0.967 4168	304.4	8.04	0.95	7 21.0
	16	12	53	10.49	-0.023	-2	53	32.2	-0.54	0.968 1490	+305.7	8.02	0.95	7 17.1
	17	12	53	10.13	-0.007	2	53	46.3	0.64	0.968 8841	306.9	8.01	0.94	7 13.1
	18	12	53	10.14	+0.008	2	54	2.8	0.74	0.969 6219	308.0	8.00	0.94	7 9.2
July	19	12	53	10.52	0.024	2	54	21.7	0.84	0.970 3623	309.0	7.98	0.94	7 5.3
	20	12	53	11.28	0.039	2	54	43.0	0.94	0.971 1050	309.9	7.97	0.94	7 1.4
	21	12	53	12.40	+0.055	-2	55	6.6	-1.03	0.971 8497	+310.7	7.96	0.94	6 57.4
	22	12	53	13.90	0.070	2	55	32.5	1.13	0.972 5962	311.4	7.94	0.94	6 53.5
	23	12	53	15.76	0.085	2	56	0.7	1.22	0.973 3443	312.0	7.93	0.94	6 49.6
	24	12	53	17.99	0.101	2	56	31.3	1.32	0.974 0937	312.5	7.91	0.93	6 45.7
	25	12	53	20.59	0.116	2	57	4.3	1.42	0.974 8442	312.9	7.90	0.93	6 41.8
	26	12	53	23.56	+0.131	-2	57	39.5	-1.51	0.975 5956	+313.2	7.89	0.93	6 38.0
	27	12	53	26.89	0.146	2	58	17.0	1.61	0.976 3477	313.5	7.87	0.93	6 34.1
	28	12	53	30.58	0.161	2	58	56.8	1.71	0.977 1003	313.7	7.86	0.93	6 30.2
	29	12	53	34.64	0.177	2	59	38.9	1.80	0.977 8533	313.8	7.85	0.93	6 26.4
30	12	53	39.06	0.191	3	0	23.2	1.89	0.978 6065	313.8	7.83	0.92	6 22.5	
July	1	12	53	43.83	+0.206	-3	1	9.7	-1.99	0.979 3596	+313.7	7.82	0.92	6 18.7
	2	12	53	48.97	+0.222	-3	1	58.5	-2.08	0.980 1125	+313.6	7.81	0.92	6 14.8

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.	Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Paralax.	Transit, Meridian of Greenwich.
	h	m	s								

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"			"	"	h	m
Aug.	16	13	3	21.66	+0.802	-4	12	27.9	-5.46	1.010 9140	+235.9	7.27	0.86	3 27.4
	17	13	3	41.03	0.812	4	14	39.5	5.51	1.011 4766	232.9	7.26	0.86	3 23.8
	18	13	4	0.64	0.822	4	16	52.3	5.56	1.012 0320	229.9	7.25	0.86	3 20.2
	19	13	4	20.48	0.832	4	19	6.4	5.61	1.012 5800	226.8	7.24	0.85	3 16.6
	20	13	4	40.56	0.841	4	21	21.7	5.66	1.013 1206	223.7	7.24	0.85	3 13.0
	21	13	5	0.87	+0.851	-4	23	38.1	-5.71	1.013 6536	+220.5	7.23	0.85	3 9.4
	22	13	5	21.40	0.860	4	25	55.7	5.76	1.014 1791	217.3	7.22	0.85	3 5.8
	23	13	5	42.15	0.869	4	28	14.5	5.80	1.014 6968	214.1	7.21	0.85	3 2.2
	24	13	6	3.12	0.878	4	30	34.3	5.85	1.015 2068	210.9	7.20	0.85	2 58.6
	25	13	6	24.30	0.887	4	32	55.2	5.89	1.015 7090	207.6	7.19	0.85	2 55.1
Sept.	26	13	6	45.70	+0.896	-4	35	17.2	-5.94	1.016 2033	+204.3	7.18	0.85	2 51.5
	27	13	7	7.30	0.904	4	37	40.2	5.98	1.016 6897	201.0	7.18	0.85	2 47.9
	28	13	7	29.11	0.913	4	40	4.2	6.02	1.017 1681	197.6	7.17	0.85	2 44.3
	29	13	7	51.12	0.921	4	42	29.2	6.06	1.017 6384	194.2	7.16	0.84	2 40.8
	30	13	8	13.33	0.929	4	44	55.1	6.10	1.018 1005	190.8	7.15	0.84	2 37.2
	31	13	8	35.73	+0.937	-4	47	22.0	-6.14	1.018 5543	+187.4	7.14	0.84	2 33.7
	1	13	8	58.33	0.945	4	49	49.8	6.18	1.018 9998	183.9	7.14	0.84	2 30.1
	2	13	9	21.11	0.953	4	52	18.5	6.21	1.019 4369	180.4	7.13	0.84	2 26.6
	3	13	9	44.08	0.961	4	54	48.0	6.25	1.019 8655	176.8	7.12	0.84	2 23.0
	4	13	10	7.23	0.968	4	57	18.4	6.28	1.020 2855	173.2	7.12	0.84	2 19.4
	5	13	10	30.56	+0.976	-4	59	49.6	-6.32	1.020 6969	+169.6	7.11	0.84	2 15.9
	6	13	10	54.07	0.983	5	2	21.6	6.35	1.021 0996	165.9	7.10	0.84	2 12.4
	7	13	11	17.74	0.990	5	4	54.3	6.38	1.021 4934	162.2	7.10	0.84	2 8.8
	8	13	11	41.59	0.997	5	7	27.8	6.41	1.021 8784	158.6	7.09	0.84	2 5.3
	9	13	12	5.60	1.004	5	10	2.0	6.44	1.022 2545	154.8	7.09	0.84	2 1.8
	10	13	12	29.77	+1.010	-5	12	36.8	-6.46	1.022 6215	+151.0	7.08	0.83	1 58.2
	11	13	12	54.09	1.017	5	15	12.3	6.49	1.022 9794	147.2	7.07	0.83	1 54.7
	12	13	13	18.57	1.023	5	17	48.5	6.52	1.023 3281	143.4	7.07	0.83	1 51.2
	13	13	13	43.20	1.029	5	20	25.2	6.54	1.023 6676	139.5	7.06	0.83	1 47.6
	14	13	14	7.97	1.035	5	23	2.5	6.57	1.023 9978	135.6	7.06	0.83	1 44.1
	15	13	14	32.88	+1.041	-5	25	40.4	-6.59	1.024 3186	+131.7	7.05	0.83	1 40.6
	16	13	14	57.93	1.046	5	28	18.8	6.61	1.024 6300	127.8	7.05	0.83	1 37.1
	17	13	15	23.11	1.052	5	30	57.7	6.63	1.024 9319	123.8	7.04	0.83	1 33.6
	18	13	15	48.42	1.057	5	33	37.0	6.65	1.025 2244	119.9	7.04	0.83	1 30.1
	19	13	16	13.84	1.062	5	36	16.7	6.66	1.025 5075	116.0	7.03	0.83	1 26.6
	20	13	16	39.39	+1.067	-5	38	56.8	-6.68	1.025 7812	+112.0	7.03	0.83	1 23.0
	21	13	17	5.05	1.072	5	41	37.3	6.70	1.026 0453	108.0	7.02	0.83	1 19.5
	22	13	17	30.83	1.076	5	44	18.2	6.71	1.026 2998	104.0	7.02	0.83	1 16.0
	23	13	17	56.72	1.081	5	46	59.4	6.72	1.026 5447	100.0	7.02	0.83	1 12.5
	24	13	18	22.71	1.085	5	49	40.9	6.74	1.026 7799	96.0	7.01	0.83	1 9.0
25	13	18	48.80	+1.089	-5	52	22.7	-6.75	1.027 0055	+ 92.0	7.01	0.83	1 5.5	
26	13	19	14.99	1.093	5	55	4.8	6.76	1.027 2213	87.9	7.00	0.83	1 2.0	
27	13	19	41.28	1.097	5	57	47.1	6.77	1.027 4273	83.8	7.00	0.83	0 58.5	
28	13	20	7.66	1.101	6	0	29.6	6.78	1.027 6236	79.7	7.00	0.83	0 55.1	
29	13	20	34.12	1.104	6	3	12.3	6.78	1.027 8101	75.7	6.99	0.83	0 51.6	
30	13	21	0.66	+1.108	-6	5	55.2	-6.79	1.027 9868	+ 71.5	6.99	0.83	0 48.1	
Oct. 1	13	21	27.29	+1.111	-6	8	38.1	-6.79	1.028 1535	+ 67.4	6.99	0.83	0 44.6	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	Noon.	Noon.	h	m
Oct.	1	13	21	27.29	+1.111	-6	8	38.1	-6.79	1.028 1535	+ 67.4	6.99	0.83	0 44.6
	2	13	21	54.00	1.114	6	11	21.2	6.80	1.028 3103	63.3	6.99	0.83	0 41.1
	3	13	22	20.78	1.117	6	14	4.4	6.80	1.028 4572	59.1	6.98	0.83	0 37.6
	4	13	22	47.63	1.120	6	16	47.6	6.80	1.028 5940	54.9	6.98	0.82	0 34.
	5	13	23	14.54	1.123	6	19	30.9	6.80	1.028 7207	50.7	6.98	0.82	0 30.6
	6	13	23	41.52	+1.125	-6	22	14.2	-6.80	1.028 8373	+ 46.5	6.98	0.82	0 27.1
	7	13	24	8.55	1.128	6	24	57.5	6.80	1.028 9438	42.3	6.98	0.82	0 23.7
	8	13	24	35.64	1.130	6	27	40.7	6.80	1.029 0402	38.0	6.98	0.82	0 20.2
	9	13	25	2.77	1.131	6	30	23.8	6.80	1.029 1264	33.8	6.97	0.82	0 16.7
	10	13	25	29.95	1.133	6	33	6.9	6.79	1.029 2024	29.5	6.97	0.82	0 13.2
	11	13	25	57.17	+1.135	-6	35	49.8	-6.79	1.029 2682	+ 25.3	6.97	0.82	0 9.7
	12	13	26	24.42	1.136	6	38	32.6	6.78	1.029 3237	21.0	6.97	0.82	0 6.3
	13	13	26	51.70	1.137	6	41	15.2	6.77	1.029 3689	16.7	6.97	0.82	0 2.8
	14	13	27	19.01	1.138	6	43	57.6	6.76	1.029 4039	12.4	6.97	0.82	23 55.8
	15	13	27	46.34	1.139	6	46	39.8	6.75	1.029 4286	8.1	6.97	0.82	23 52.3
	16	13	28	13.69	+1.140	-6	49	21.6	-6.74	1.029 4430	+ 3.9	6.97	0.82	23 48.9
	17	13	28	41.05	1.140	6	52	3.2	6.73	1.029 4471	- 0.4	6.97	0.82	23 45.4
	18	13	29	8.42	1.141	6	54	44.5	6.71	1.029 4410	4.6	6.97	0.82	23 41.9
	19	13	29	35.80	1.141	6	57	25.5	6.70	1.029 4247	8.9	6.97	0.82	23 38.4
	20	13	30	3.18	1.141	7	0	6.0	6.68	1.029 3981	13.2	6.97	0.82	23 35.0
	21	13	30	30.55	+1.140	-7	2	46.2	-6.67	1.029 3613	- 17.5	6.97	0.82	23 31.5
	22	13	30	57.92	1.140	7	5	26.0	6.65	1.029 3143	21.7	6.97	0.82	23 28.0
	23	13	31	25.27	1.139	7	8	5.4	6.63	1.029 2571	26.0	6.97	0.82	23 24.5
	24	13	31	52.61	1.139	7	10	44.2	6.61	1.029 1897	30.2	6.97	0.82	23 21.0
	25	13	32	19.94	1.138	7	13	22.6	6.59	1.029 1120	34.5	6.97	0.82	23 17.6
	26	13	32	47.24	+1.137	-7	16	0.5	-6.57	1.029 0242	- 38.7	6.97	0.82	23 14.1
	27	13	33	14.52	1.136	7	18	37.9	6.55	1.028 9261	43.0	6.98	0.82	23 10.6
	28	13	33	41.77	1.135	7	21	14.7	6.52	1.028 8179	47.2	6.98	0.82	23 7.1
	29	13	34	8.98	1.133	7	23	50.9	6.50	1.028 6995	51.5	6.98	0.82	23 3.6
	30	13	34	36.16	1.131	7	26	26.6	6.47	1.028 5709	55.7	6.98	0.82	23 0.2
Nov.	31	13	35	3.29	+1.130	-7	29	1.6	-6.45	1.028 4320	- 60.0	6.98	0.83	22 56.7
	1	13	35	30.38	1.128	7	31	36.0	6.42	1.028 2829	64.2	6.99	0.83	22 53.2
	2	13	35	57.41	1.125	7	34	9.6	6.39	1.028 1237	68.5	6.99	0.83	22 49.7
	3	13	36	24.39	1.123	7	36	42.6	6.36	1.027 9542	72.7	6.99	0.83	22 46.2
	4	13	36	51.32	1.121	7	39	14.9	6.33	1.027 7746	77.0	6.99	0.83	22 42.7
	5	13	37	18.18	+1.118	-7	41	46.4	-6.30	1.027 5848	- 81.2	7.00	0.83	22 39.2
	6	13	37	44.97	1.115	7	44	17.1	6.26	1.027 3848	85.4	7.00	0.83	22 35.7
	7	13	38	11.69	1.112	7	46	47.1	6.23	1.027 1747	89.7	7.00	0.83	22 32.2
	8	13	38	38.33	1.108	7	49	16.2	6.20	1.026 9544	93.9	7.01	0.83	22 28.7
	9	13	39	4.88	1.105	7	51	44.5	6.16	1.026 7240	98.1	7.01	0.83	22 25.2
	10	13	39	31.35	+1.101	-7	54	11.9	-6.12	1.026 4836	-102.3	7.02	0.83	22 21.8
	11	13	39	57.72	1.097	7	56	38.4	6.09	1.026 2331	106.4	7.02	0.83	22 18.3
	12	13	40	24.00	1.093	7	59	4.0	6.05	1.025 9727	110.6	7.02	0.83	22 14.8
	13	13	40	50.17	1.088	8	1	28.6	6.00	1.025 7023	114.7	7.03	0.83	22 11.3
	14	13	41	16.24	1.084	8	3	52.2	5.96	1.025 4221	118.8	7.03	0.83	22 7.8
	15	13	41	42.20	+1.079	-8	6	14.8	-5.92	1.025 1320	-122.9	7.04	0.83	22 4.3
16	13	42	8.04	+1.074	-8	8	36.4	-5.88	1.024 8322	-127.0	7.04	0.83	22 0.8	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Logarithm of Distance from Earth.	Var. per Hour.	Polar Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.
	Noon.			Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	Noon.	h m
Nov. 16	h	m	s	s	°	'	"	"			"	"	h m
	13	42	8.04	+1.074	-8	8	36.4	-5.88	1.024 8322	-127.0	7.04	0.83	22 0.8
	13	42	33.76	1.069	8	10	56.9	5.83	1.024 5226	131.0	7.05	0.83	21 57.3
	13	42	59.35	1.064	8	13	16.4	5.79	1.024 2035	135.0	7.05	0.83	21 53.8
	13	43	24.82	1.058	8	15	34.8	5.74	1.023 8748	139.0	7.06	0.83	21 50.3
	13	43	50.15	1.053	8	17	52.0	5.69	1.023 5365	142.9	7.06	0.83	21 46.8
	13	44	15.35	+1.047	-8	20	8.1	-5.65	1.023 1887	-146.9	7.07	0.83	21 43.2
	13	44	40.40	1.041	8	22	23.1	5.60	1.022 8315	150.8	7.08	0.83	21 39.7
	13	45	5.31	1.035	8	24	36.9	5.55	1.022 4648	154.7	7.08	0.84	21 36.2
	13	45	30.08	1.029	8	26	49.5	5.50	1.022 0887	158.6	7.09	0.84	21 32.6
Dec. 1	13	45	54.69	1.022	8	29	0.9	5.45	1.021 7033	162.5	7.09	0.84	21 29.1
	13	46	19.14	+1.015	-8	31	11.0	-5.39	1.021 3087	-166.3	7.10	0.84	21 25.6
	13	46	43.43	1.008	8	33	19.8	5.34	1.020 9049	170.1	7.11	0.84	21 22.1
	13	47	7.55	1.001	8	35	27.4	5.29	1.020 4920	173.9	7.11	0.84	21 18.5
	13	47	31.50	0.994	8	37	33.7	5.24	1.020 0700	177.7	7.12	0.84	21 15.0
	13	47	55.28	0.987	8	39	38.7	5.18	1.019 6390	181.5	7.13	0.84	21 11.5
	13	48	18.88	+0.979	-8	41	42.3	-5.12	1.019 1989	-185.2	7.13	0.84	21 7 9
	13	48	42.29	0.972	8	43	44.5	5.06	1.018 7499	188.9	7.14	0.84	21 4.4
	13	49	5.52	0.964	8	45	45.4	5.01	1.018 2921	192.6	7.15	0.84	21 0.8
	13	49	28.55	0.955	8	47	44.8	4.95	1.017 8255	196.2	7.16	0.84	20 57.3
	13	49	51.38	0.947	8	49	42.8	4.89	1.017 3502	199.9	7.16	0.85	20 53.7
	13	50	14.01	+0.938	-8	51	39.3	-4.83	1.016 8662	-203.4	7.17	0.85	20 50.1
	13	50	36.42	0.929	8	53	34.4	4.76	1.016 3738	206.9	7.18	0.85	20 46.6
	13	50	58.62	0.920	8	55	27.9	4.70	1.015 8729	210.5	7.19	0.85	20 43.0
	13	51	20.60	0.911	8	57	19.9	4.63	1.015 3636	213.9	7.20	0.85	20 39.5
	13	51	42.36	0.902	8	59	10.3	4.57	1.014 8461	217.3	7.21	0.85	20 35.9
	13	52	3.89	+0.892	-9	0	59.2	-4.50	1.014 3205	-220.7	7.22	0.85	20 32.3
	13	52	25.18	0.882	9	2	46.5	4.44	1.013 7868	224.0	7.22	0.85	20 28.7
	13	52	46.24	0.872	9	4	32.2	4.37	1.013 2453	227.2	7.23	0.85	20 25.1
	13	53	7.05	0.862	9	6	16.2	4.30	1.012 6961	230.4	7.24	0.85	20 21.5
	13	53	27.62	0.852	9	7	58.6	4.23	1.012 1392	233.6	7.25	0.86	20 17.9
	13	53	47.94	+0.842	-9	9	39.3	-4.16	1.011 5747	-236.7	7.26	0.86	20 14.3
13	54	8.01	0.831	9	11	18.3	4.09	1.011 0028	239.8	7.27	0.86	20 10.7	
13	54	27.82	0.820	9	12	55.6	4.02	1.010 4235	242.9	7.28	0.86	20 7.1	
13	54	47.36	0.809	9	14	31.2	3.95	1.009 8371	245.8	7.29	0.86	20 3.5	
13	55	6.64	0.798	9	16	5.1	3.88	1.009 2437	248.7	7.30	0.86	19 59.9	
13	55	25.65	+0.786	-9	17	37.2	-3.80	1.008 6432	-251.6	7.31	0.86	19 56.3	
13	55	44.39	0.775	9	19	7.6	3.73	1.008 0359	254.4	7.32	0.86	19 52.6	
13	56	2.85	0.763	9	20	36.2	3.65	1.007 4219	257.2	7.33	0.87	19 49.0	
13	56	21.02	0.751	9	22	3.0	3.58	1.006 8013	259.9	7.34	0.87	19 45.4	
13	56	38.91	0.739	9	23	28.0	3.50	1.006 1742	262.6	7.35	0.87	19 41.8	
13	56	56.51	+0.727	-9	24	51.2	-3.43	1.005 5407	-265.2	7.36	0.87	19 38.1	
13	57	13.82	0.715	9	26	12.5	3.35	1.004 9010	267.8	7.37	0.87	19 34.5	
13	57	30.82	0.702	9	27	31.9	3.27	1.004 2552	270.4	7.38	0.87	19 30.8	
13	57	47.53	0.690	9	28	49.5	3.19	1.003 6033	272.9	7.40	0.87	19 27.1	
13	58	3.93	0.677	9	30	5.2	3.11	1.002 9455	275.3	7.41	0.87	19 23.5	
13	58	20.02	+0.664	-9	31	19.0	-3.03	1.002 2821	-277.6	7.42	0.88	19 19.8	
13	58	35.79	...	-9	32	30.8	...	1.001 6131	...	7.43	0.88	19 16.2	

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	' "	' "	° ' "	"		
Jan.	2	193 39 2.7	1 58.03	+0 31.2	+2 27 19.4	+0.84	0.983 3795	+131.0
	10	193 54 51.5	1 58.58	0 30.1	2 27 26.0	0.81	0.983 4842	130.8
	18	194 10 39.9	1 58.52	0 29.5	2 27 32.4	0.79	0.983 5887	130.6
	26	194 26 27.8	1 58.46	0 28.7	2 27 38.6	0.76	0.983 6931	130.4
Feb.	3	194 42 15.3	1 58.41	0 27.8	2 27 44.6	0.74	0.983 7973	130.2
	11	194 58 2.3	1 58.35	+0 27.0	+2 27 50.4	+0.72	0.983 9014	+130.0
	19	195 13 48.9	1 58.29	0 26.1	2 27 56.1	0.69	0.984 0053	129.8
	27	195 29 35.0	1 58.24	0 25.2	2 28 1.5	0.67	0.984 1090	129.6
Mar.	7	195 45 20.7	1 58.18	0 24.4	2 28 6.8	0.64	0.984 2126	129.4
	15	196 1 5.9	1 58.12	0 23.5	2 28 11.8	0.62	0.984 3160	129.2
	23	196 16 50.6	1 58.07	+0 22.6	+2 28 16.7	+0.63	0.984 4193	+129.0
	31	196 32 35.0	1 58.01	0 21.8	2 28 21.4	0.58	0.984 5224	128.8
Apr.	8	196 48 18.8	1 57.95	0 20.9	2 28 25.9	0.55	0.984 6253	128.6
	16	197 4 2.2	1 57.90	0 20.0	2 28 30.2	0.53	0.984 7281	128.4
	24	197 19 45.2	1 57.85	0 19.1	2 28 34.4	0.51	0.984 8307	128.1
May	2	197 35 27.8	1 57.79	+0 18.3	+2 28 38.3	+0.48	0.984 9331	+127.9
	10	197 51 9.9	1 57.74	0 17.4	2 28 42.1	0.46	0.985 0353	127.7
	18	198 6 51.6	1 57.68	0 16.5	2 28 45.7	0.44	0.985 1374	127.5
	26	198 22 32.8	1 57.62	0 15.6	2 28 49.1	0.41	0.985 2393	127.3
June	3	198 38 13.6	1 57.57	0 14.8	2 28 52.3	0.39	0.985 3410	127.1
	11	198 53 54.0	1 57.52	+0 13.9	+2 28 55.3	+0.36	0.985 4426	+126.8
	19	199 9 33.9	1 57.46	0 13.0	2 28 58.1	0.34	0.985 5439	126.6
	27	199 25 13.3	1 57.40	0 12.1	2 29 0.7	0.32	0.985 6451	126.4
July	5	199 40 52.3	1 57.35	0 11.2	2 29 3.2	0.29	0.985 7461	126.1
	13	199 56 30.9	1 57.30	0 10.4	2 29 5.4	0.27	0.985 8469	125.9
	21	200 12 9.1	1 57.24	+0 9.5	+2 29 7.5	+0.25	0.985 9475	+125.6
	29	200 27 46.8	1 57.19	0 8.6	2 29 9.4	0.22	0.986 0479	125.4
Aug.	6	200 43 24.1	1 57.14	0 7.7	2 29 11.1	0.20	0.986 1481	125.2
	14	200 59 1.0	1 57.08	0 6.8	2 29 12.6	0.18	0.986 2482	125.0
	22	201 14 37.4	1 57.02	0 6.0	2 29 13.9	0.16	0.986 3481	124.7
	30	201 30 13.4	1 56.97	+0 5.1	+2 29 15.1	+0.13	0.986 4478	+124.4
Sept.	7	201 45 49.0	1 56.92	0 4.2	2 29 16.0	0.11	0.986 5472	124.1
	15	202 1 24.1	1 56.86	0 3.3	2 29 16.8	0.09	0.986 6464	123.9
	23	202 16 58.8	1 56.81	0 2.4	2 29 17.4	0.06	0.986 7454	123.6
Oct.	1	202 32 33.1	1 56.76	0 1.5	2 29 17.8	0.04	0.986 8442	123.3
	9	202 48 7.0	1 56.71	+0 0.7	+2 29 18.1	+0.02	0.986 9427	+123.0
	17	203 3 40.4	1 56.65	-0 0.2	2 29 18.1	-0.01	0.987 0410	122.8
	25	203 19 13.4	1 56.60	0 1.1	2 29 18.0	0.03	0.987 1391	122.5
Nov.	2	203 34 46.0	1 56.55	0 2.0	2 29 17.7	0.05	0.987 2370	122.3
	10	203 50 18.2	1 56.49	0 2.9	2 29 17.2	0.07	0.987 3347	122.0
	18	204 5 49.9	1 56.44	-0 3.7	+2 29 16.5	-0.09	0.987 4322	+121.8
	26	204 21 21.3	1 56.39	0 4.6	2 29 15.7	0.12	0.987 5295	121.5
Dec.	4	204 36 52.2	1 56.34	0 5.5	2 29 14.6	0.14	0.987 6266	121.2
	12	204 52 22.7	1 56.29	0 6.4	2 29 13.4	0.16	0.987 7234	120.9
	20	205 7 52.8	1 56.23	0 7.3	2 29 12.0	0.19	0.987 8200	120.6
	28	205 23 22.4	1 56.18	-0 8.1	+2 29 10.4	-0.21	0.987 9164	+120.4
	36	205 38 51.6	1 56.12	-0 9.0	+2 29 8.6	-0.23	0.988 0126	+120.1

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.	
	Noon.				Noon.									
	h	m	s	s	°	'	"	"	Noon.	Noon.	"	"	h	m
Jan.	0	22	48	48.11	+ 7.542	- 8	22	5.6	+47.99	1.312 5743	+3214.7	1.67	0.43	4 11.6
	4	22	49	19.50	8.151	8	18	46.3	51.64	1.313 8337	3080.6	1.66	0.43	3 56.4
	8	22	49	53.28	8.733	8	15	12.7	55.13	1.315 0372	2934.7	1.66	0.43	3 41.3
	12	22	50	29.32	9.283	8	11	25.5	58.43	1.316 1798	2776.1	1.66	0.43	3 26.1
	16	22	51	7.50	9.800	8	7	25.5	61.54	1.317 2565	2605.7	1.65	0.42	3 11.0
	20	22	51	47.67	+10.280	- 8	3	13.5	+64.40	1.318 2629	+2424.1	1.65	0.42	2 56.0
	24	22	52	29.68	10.716	7	58	50.6	67.01	1.319 1946	2233.6	1.64	0.42	2 40.9
	28	22	53	13.34	11.109	7	54	17.7	69.39	1.320 0488	2035.7	1.64	0.42	2 25.9
Feb.	1	22	53	58.50	11.463	7	49	35.8	71.53	1.320 8223	1831.3	1.64	0.42	2 10.9
	5	22	54	44.99	11.777	7	44	45.8	73.43	1.321 5131	1621.6	1.64	0.42	1 56.0
	9	22	55	32.67	+12.057	- 7	39	48.7	+75.08	1.322 1187	+1404.8	1.63	0.42	1 41.1
	13	22	56	21.39	12.293	7	34	45.5	76.47	1.322 6363	1183.4	1.63	0.42	1 26.1
	17	22	57	10.95	12.480	7	29	37.3	77.60	1.323 0648	957.1	1.63	0.42	1 11.2
	21	22	58	1.17	12.623	7	24	25.1	78.45	1.323 4016	727.9	1.63	0.42	0 56.3
	25	22	58	51.88	12.723	7	19	10.1	79.02	1.323 6470	497.8	1.63	0.42	0 41.5
	Mar.	1	22	59	42.90	+12.781	- 7	13	53.3	+79.33	1.323 7998	+ 267.7	1.63	0.42	0 26.6
5	23	0	34.07	12.797	7	8	35.8	79.38	1.323 8612	+ 38.0	1.63	0.42	0 11.7	
9	23	1	25.22	12.773	7	3	18.6	79.19	1.323 8302	- 191.6	1.63	0.42	23 53.1	
13	23	2	16.20	12.708	6	58	2.6	78.75	1.323 7079	421.3	1.63	0.42	23 38.2	
17	23	3	6.83	12.600	6	52	49.0	78.01	1.323 4933	650.0	1.63	0.42	23 23.3	
21	23	3	56.94	+12.447	- 6	47	38.9	+77.00	1.323 1884	- 874.5	1.63	0.42	23 8.4	
25	23	4	46.35	12.251	6	42	33.3	75.76	1.322 7943	1094.8	1.63	0.42	22 53.5	
29	23	5	34.90	12.017	6	37	33.2	74.24	1.322 3133	1309.4	1.63	0.42	22 38.6	
Apr.	2	23	6	22.44	11.748	6	32	39.7	72.50	1.321 7475	1518.5	1.63	0.42	22 23.6
	6	23	7	8.84	11.445	6	27	53.5	70.54	1.321 0992	1722.3	1.64	0.42	22 8.7
	10	23	7	53.95	+11.105	- 6	23	15.7	+68.34	1.320 3705	-1919.9	1.64	0.42	21 53.7
	14	23	8	37.63	10.726	6	18	47.1	65.92	1.319 5642	2110.7	1.64	0.42	21 38.7
	18	23	9	19.71	10.308	6	14	28.7	63.22	1.318 6830	2293.6	1.65	0.42	21 23.7
	22	23	10	0.05	9.858	6	10	21.6	60.33	1.317 7306	2466.6	1.65	0.42	21 8.6
	26	23	10	38.53	9.376	6	6	26.3	57.26	1.316 7111	2628.9	1.65	0.42	20 53.5
	30	23	11	15.02	+ 8.867	- 6	2	43.8	+53.98	1.315 6289	-2780.7	1.66	0.43	20 38.3
May	4	23	11	49.43	8.333	5	59	14.7	50.56	1.314 4879	2922.6	1.66	0.43	20 23.2
	8	23	12	21.65	7.772	5	55	59.6	46.94	1.313 2922	3054.6	1.67	0.43	20 8.0
	12	23	12	51.57	7.180	5	52	59.4	43.15	1.312 0458	3174.6	1.67	0.43	19 52.8
	16	23	13	19.06	6.563	5	50	14.6	39.22	1.310 7543	3281.2	1.68	0.43	19 37.5
	20	23	13	44.05	+ 5.926	- 5	47	45.8	+35.15	1.309 4227	-3374.3	1.68	0.43	19 22.2
	24	23	14	6.44	5.269	5	45	33.6	30.94	1.308 0569	3451.8	1.69	0.43	19 6.8
	28	23	14	26.18	4.598	5	43	38.4	26.66	1.306 6631	3515.5	1.69	0.43	18 51.4
	June	1	23	14	43.21	3.916	5	42	0.4	22.31	1.305 2463	3566.0	1.70	0.44	18 36.0
5	23	14	57.49	3.221	5	40	40.0	17.87	1.303 8123	3601.0	1.70	0.44	18 20.5	
9	23	15	8.96	+ 2.513	- 5	39	37.5	+13.37	1.302 3674	-3622.2	1.71	0.44	18 4.9	
13	23	15	17.58	1.796	5	38	53.1	8.84	1.300 9167	3626.9	1.71	0.44	17 49.3	
17	23	15	23.32	1.074	5	38	26.8	+ 4.29	1.299 4683	3613.0	1.72	0.44	17 33.6	
21	23	15	26.17	+ 0.353	5	38	18.8	- 0.27	1.298 0285	3582.7	1.73	0.44	17 17.9	
25	23	15	26.15	- 0.361	5	38	28.9	4.77	1.296 6044	3535.0	1.73	0.44	17 2.2	
29	23	15	23.29	- 1.066	- 5	38	56.9	- 9.21	1.295 2025	-3172.5	1.74	0.45	16 46.4	
July	3	23	15	17.63	- 1.764	- 5	39	42.5	-13.57	1.293 8285	-3394.3	1.74	0.45	16 30.6

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.		
	Noon.				Noon.										
	h	m	s	s	°	'	"	"			"	"	h	m	
July	3	23	15	17.63	-1.764	-5	39	42.5	-13.57	1.293 8285	-3394.3	1.74	0.45	16	30.6
	7	23	15	9.19	2.454	5	40	45.4	17.87	1.292 4893	3299.0	1.75	0.45	16	14.7
	11	23	14	58.02	3.123	5	42	5.3	22.08	1.291 1916	3186.2	1.75	0.45	15	58.8
	15	23	14	44.19	3.784	5	43	41.8	26.13	1.289 9426	3056.8	1.76	0.45	15	42.8
	19	23	14	27.78	4.414	5	45	34.1	29.98	1.288 7484	2910.3	1.76	0.45	15	26.8
	23	23	14	8.92	-5.010	-5	47	41.4	-33.63	1.287 6164	-2748.2	1.77	0.45	15	10.8
	27	23	13	47.74	5.575	5	50	2.9	37.09	1.286 5516	2573.2	1.77	0.45	14	54.7
	31	23	13	24.36	6.109	5	52	37.8	40.32	1.285 5597	2384.2	1.78	0.46	14	38.6
Aug.	4	23	12	58.91	6.611	5	55	25.1	43.29	1.284 6461	2181.3	1.78	0.46	14	22.4
	8	23	12	31.53	7.070	5	58	23.8	46.01	1.283 8164	1965.4	1.78	0.46	14	6.3
	12	23	12	2.41	-7.484	-6	1	32.8	-48.44	1.283 0754	-1737.3	1.79	0.46	13	50.1
	16	23	11	31.72	7.850	6	4	50.9	50.53	1.282 4281	1497.5	1.79	0.46	13	33.8
	20	23	10	59.68	8.162	6	8	16.6	52.28	1.281 8786	1248.7	1.79	0.46	13	17.5
	24	23	10	26.50	8.419	6	11	48.7	53.70	1.281 4300	994.0	1.79	0.46	13	1.3
	28	23	9	52.40	8.623	6	15	25.7	54.74	1.281 0842	733.7	1.79	0.46	12	45.0
	Sept.	1	23	9	17.58	-8.778	-6	19	6.2	-55.47	1.280 8439	-466.5	1.80	0.46	12	28.7
5		23	8	42.25	8.877	6	22	49.0	55.84	1.280 7115	-195.9	1.80	0.46	12	12.4
9		23	8	6.65	8.912	6	26	32.4	55.80	1.280 6875	+ 77.2	1.80	0.46	11	56.0
13		23	7	31.04	8.885	6	30	14.9	55.10	1.280 7735	352.5	1.80	0.46	11	39.7
17		23	6	55.65	8.796	6	33	55.1	54.60	1.280 9692	625.3	1.79	0.46	11	23.4
21		23	6	20.75	-8.648	-6	37	31.2	-53.13	1.281 2732	+ 893.6	1.79	0.46	11	7.1
25		23	5	46.54	8.444	6	41	2.1	51.93	1.281 6834	1156.8	1.79	0.46	10	50.8
29		23	5	13.27	8.185	6	44	26.2	50.07	1.282 1979	1414.8	1.79	0.46	10	34.5
Oct.	3	23	4	41.13	7.872	6	47	42.2	47.89	1.282 8143	1665.9	1.79	0.46	10	18.3
	7	23	4	10.37	7.503	6	50	48.9	45.38	1.283 5295	1908.6	1.78	0.46	10	2.0
	11	23	3	41.18	-7.079	-6	53	44.8	-42.52	1.284 3399	+2141.8	1.78	0.46	9	45.8
	15	23	3	13.81	6.600	6	56	28.7	39.37	1.285 2413	2362.6	1.78	0.46	9	29.6
	19	23	2	48.44	6.079	6	58	59.4	35.97	1.286 2279	2567.2	1.77	0.46	9	13.5
	23	23	2	25.23	5.520	7	1	16.1	32.32	1.287 2932	2757.9	1.77	0.45	8	57.4
	27	23	2	4.33	4.922	7	3	17.7	28.46	1.288 4324	2935.5	1.76	0.45	8	41.3
	31	23	1	45.90	-4.289	-7	5	3.5	-24.41	1.289 6395	+3096.8	1.76	0.45	8	25.3
Nov.	4	23	1	30.06	3.625	7	6	32.7	20.16	1.290 9077	3242.2	1.75	0.45	8	9.3
	8	23	1	16.94	2.929	7	7	44.6	15.76	1.292 2310	3370.7	1.75	0.45	7	53.4
	12	23	1	6.66	2.208	7	8	38.6	11.22	1.293 6017	3479.3	1.74	0.45	7	37.5
	16	23	0	59.30	1.469	7	9	14.2	6.58	1.295 0119	3568.8	1.74	0.45	7	21.6
	20	23	0	54.92	-0.721	-7	9	31.2	-1.89	1.296 4543	+3639.9	1.73	0.45	7	5.8
	24	23	0	53.54	+0.034	7	9	29.3	+ 2.83	1.297 9214	3692.7	1.73	0.44	6	50.1
	28	23	0	55.20	0.796	7	9	8.5	7.57	1.299 4061	3728.2	1.72	0.44	6	34.4
	2	23	0	59.91	1.561	7	8	28.7	12.33	1.300 9015	3745.3	1.71	0.44	6	18.8
Dec.	6	23	1	7.69	2.328	7	7	29.9	17.07	1.302 3999	3744.0	1.71	0.44	6	3.2
	10	23	1	18.53	+3.089	-7	6	12.2	+21.78	1.303 8942	+3723.9	1.70	0.44	5	47.6
	14	23	1	32.39	3.839	7	4	35.8	26.41	1.305 3765	3684.7	1.70	0.44	5	32.1
	18	23	1	49.22	4.571	7	2	41.1	30.92	1.306 8397	3628.6	1.69	0.43	5	16.7
	22	23	2	8.93	5.284	7	0	28.6	35.31	1.308 2773	3556.8	1.69	0.43	5	1.3
	26	23	2	31.46	5.977	6	57	58.8	39.57	1.309 6831	3469.5	1.68	0.43	4	45.9
	30	23	2	56.72	+6.649	-6	55	12.2	+43.71	1.311 0510	+3367.7	1.68	0.43	4	30.6
	34	23	3	24.62	...	-6	52	9.3	...	1.312 3755	...	1.67	0.43	4	15.4

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day
		° ' "	"	"	° ' "	"		
Jan.	4	342 54 46.5	38.58	+0.2	-0 46 20.0	0.00	1.302 8960	+5.8
	14	343 1 12.3	38.59	0.2	0 46 20.0	0.00	1.302 9018	5.8
	24	343 7 38.2	38.59	0.2	0 46 20.1	0.00	1.302 9075	5.7
Feb.	3	343 14 4.1	38.59	+0.1	-0 46 20.1	0.00	1.302 9131	+5.6
	13	343 20 30.0	38.59	0.1	0 46 20.2	0.00	1.302 9187	5.6
	23	343 26 55.9	38.59	+0.1	0 46 20.2	0.00	1.302 9242	5.5
Mar.	5	343 33 21.7	38.59	0.0	-0 46 20.2	0.00	1.302 9297	+5.4
	15	343 39 47.6	38.59	0.0	0 46 20.2	0.00	1.302 9350	5.3
	25	343 46 13.4	38.59	-0.1	0 46 20.2	0.00	1.302 9403	5.2
Apr.	4	343 52 39.3	38.59	-0.1	-0 46 20.2	0.00	1.302 9455	+5.2
	14	343 59 5.1	38.59	0.1	0 46 20.2	0.00	1.302 9506	5.1
	24	344 5 31.0	38.59	0.2	0 46 20.2	0.00	1.302 9557	5.0
May	4	344 11 56.8	38.59	-0.2	-0 46 20.1	0.00	1.302 9607	+5.0
	14	344 18 22.7	38.59	0.2	0 46 20.1	0.00	1.302 9656	4.9
	24	344 24 48.5	38.59	0.3	0 46 20.0	+0.01	1.302 9705	4.8
June	3	344 31 14.4	38.59	-0.3	-0 46 19.9	+0.01	1.302 9753	+4.8
	13	344 37 40.2	38.59	0.3	0 46 19.8	0 01	1.302 9800	4.7
	23	344 44 6.1	38.59	0.4	0 46 19.7	0.01	1.302 9847	4.6
July	3	344 50 31.9	38.59	-0.4	-0 46 19.6	+0.01	1.302 9893	+4.6
	13	344 56 57.8	38.59	0.4	0 46 19.5	0.01	1.302 9938	4.5
	23	345 3 23.6	38.59	0.5	0 46 19.4	0.01	1.302 9983	4.4
Aug.	2	345 9 49.5	38.59	-0.5	-0 46 19.3	+0.01	1.303 0027	+4.4
	12	345 16 15.4	38.59	0.5	0 46 19.1	0.01	1.303 0071	4.3
	22	345 22 41.3	38.59	0.6	0 46 19.0	0.01	1.303 0114	4.2
Sept.	1	345 29 7.1	38.59	-0.6	-0 46 18.8	+0.01	1.303 0156	+4.2
	11	345 35 33.0	38.59	0.6	0 46 18.7	0.01	1.303 0198	4.1
	21	345 41 58.9	38.59	0.7	0 46 18.5	0.02	1.303 0239	4.0
Oct.	1	345 48 24.8	38.59	-0.7	-0 46 18.3	+0.02	1.303 0279	+4.0
	11	345 54 50.6	38.59	0.8	0 46 18.1	0.02	1.303 0319	3.9
	21	346 1 16.5	38.59	0.8	0 46 17 9	0.02	1.303 0358	3.9
	31	346 7 42.4	38.59	-0.8	-0 46 17.7	+0.02	1.303 0397	+3.8
Nov.	10	346 14 8.3	38.59	0.9	0 46 17.5	0.02	1.303 0435	3.7
	20	346 20 34.1	38.59	0.9	0 46 17.2	0.02	1.303 0472	3.6
	30	346 27 0.0	38.59	-0.9	-0 46 17.0	+0.02	1.303 0508	+3.6
Dec.	10	346 33 25.9	38.59	1.0	0 46 16.7	0.02	1.303 0544	3.5
	20	346 39 51.8	38.59	1.0	0 46 16.5	0.02	1.303 0579	3.5
	30	346 46 17.7	38.59	-1.0	-0 46 16.2	+0.03	1.303 0614	+3.4
	40	346 52 43.6	38.59	-1.1	-0 46 15.9	+0.03	1.303 0648	+3.3

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.			Var. per Day.	Apparent Declination.			Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi-diameter.	Hor. Parallax.	Transit, Meridian of Greenwich.	
	Noon.				Noon.									Noon.
	h	m	s	s	°	'	"	"			"	"	h	m
Jan.	0	9 21	0.01	-4.835	+15 41	18.6		+23.41	1.466 9804	-1605.7	1.25	0.30	14 42.0	
	4	9 20	39.95	5.190	15 42	55.5		25.00	1.466 3669	1460.4	1.25	0.30	14 26.0	
	8	9 20	18.53	5.513	15 44	38.4		26.44	1.465 8131	1307.5	1.25	0.30	14 9.9	
	12	9 19	55.89	5.803	15 46	26.8		27.72	1.465 3220	1146.1	1.25	0.30	13 53.8	
	16	9 19	32.16	6.055	15 48	19.9		28.79	1.464 8972	977.4	1.25	0.30	13 37.7	
	20	9 19	7.51	-6.263	+15 50	16.9		+29.68	1.464 5409	- 802.7	1.25	0.30	13 21.5	
Feb.	24	9 18	42.11	6.429	15 52	17.1		30.37	1.464 2556	623.6	1.26	0.30	13 5.4	
	28	9 18	16.13	6.555	15 54	19.6		30.86	1.464 0424	442.0	1.26	0.30	12 49.2	
	1	9 17	49.73	6.636	15 56	23.7		31.15	1.463 9023	258.2	1.26	0.30	12 33.0	
	5	9 17	23.10	6.674	15 58	28.5		31.23	1.463 8360	- 73.4	1.26	0.30	12 16.9	
	9	9 16	56.39	-6.674	+16 0	33.3		+31.13	1.463 8436	+ 111.5	1.26	0.30	12 0.7	
	13	9 16	29.77	6.628	16 2	37.3		30.82	1.463 9252	296.9	1.26	0.30	11 44.5	
	17	9 16	3.43	6.536	16 4	39.6		30.32	1.464 0808	479.8	1.26	0.30	11 28.3	
	21	9 15	37.54	6.402	16 6	39.6		29.62	1.464 3086	660.0	1.26	0.30	11 12.2	
	25	9 15	12.27	6.224	16 8	36.3		28.73	1.464 6080	833.7	1.25	0.30	10 56.1	
	Mar.	1	9 14	47.80	-6.007	+16 10	29.2		+27.69	1.464 9748	+1001.7	1.25	0.30	10 39.9
5	9 14	24.26	5.757	16 12	17.6		26.48	1.465 4087	1165.2	1.25	0.30	10 23.8		
9	9 14	1.79	5.471	16 14	0.8		25.10	1.465 9060	1321.4	1.25	0.30	10 7.7		
13	9 13	40.54	5.149	16 15	38.2		23.58	1.466 4648	1470.4	1.25	0.30	9 51.6		
17	9 13	20.64	4.791	16 17	9.3		21.93	1.467 0811	1610.2	1.25	0.30	9 35.6		
21	9 13	2.23	-4.407	+16 18	33.5		+20.14	1.467 7517	+1741.0	1.25	0.30	9 19.6		
25	9 12	45.42	3.994	16 19	50.3		18.25	1.468 4725	1861.4	1.24	0.30	9 3.6		
29	9 12	30.31	3.558	16 20	59.4		16.26	1.469 2393	1970.6	1.24	0.30	8 47.6		
Apr.	2	9 12	16.98	3.103	16 22	0.3		14.18	1.470 0475	2068.7	1.24	0.30	8 31.6	
6	9 12	5.51	2.629	16 22	52.8		12.05	1.470 8929	2156.9	1.24	0.30	8 15.7		
10	9 11	55.97	-2.140	+16 23	36.6		+ 9.85	1.471 7716	+2234.7	1.23	0.30	7 59.8		
14	9 11	48.41	1.636	16 24	11.5		7.58	1.472 6791	2300.6	1.23	0.30	7 44.0		
18	9 11	42.90	1.119	16 24	37.2		5.27	1.473 6105	2354.6	1.23	0.30	7 28.2		
22	9 11	39.47	0.596	16 24	53.6		2.93	1.474 5611	2395.5	1.23	0.29	7 12.4		
26	9 11	38.14	-0.069	16 25	0.6		+ 0.57	1.475 5253	2424.4	1.22	0.29	6 56.6		
30	9 11	38.92	+0.456	+16 24	58.2		- 1.76	1.476 4992	+2442.7	1.22	0.29	6 40.9		
May	4	9 11	41.79	0.980	16 24	46.5		4.10	1.477 4780	2450.2	1.22	0.29	6 25.3	
8	9 11	46.76	1.504	16 24	25.4		6.44	1.478 4579	2447.0	1.21	0.29	6 9.6		
12	9 11	53.82	2.025	16 23	55.0		8.75	1.479 4341	2432.4	1.21	0.29	5 54.0		
16	9 12	2.95	2.539	16 23	15.4		11.04	1.480 4023	2406.0	1.21	0.29	5 38.4		
20	9 12	14.12	+3.042	+16 22	26.7		-13.30	1.481 3575	+2369.2	1.21	0.29	5 22.9		
24	9 12	27.27	3.531	16 21	29.1		15.49	1.482 2963	2322.3	1.20	0.29	5 7.4		
28	9 12	42.35	4.007	16 20	22.9		17.61	1.483 2140	2265.3	1.20	0.29	4 51.9		
June	1	9 12	59.30	4.404	16 19	8.3		19.68	1.484 1074	2200.4	1.20	0.29	4 36.5	
5	9 13	18.04	4.908	16 17	45.5		21.70	1.484 9731	2126.3	1.20	0.29	4 21.1		
9	9 13	38.54	+5.336	+16 16	14.8		-23.62	1.485 8073	+2043.7	1.19	0.29	4 5.7		
13	9 14	0.70	5.744	16 14	36.6		25.47	1.486 6070	1953.2	1.19	0.29	3 50.3		
17	9 14	24.46	6.130	16 12	51.1		27.25	1.487 3687	1853.9	1.19	0.29	3 35.0		
21	9 14	49.71	6.492	16 10	58.7		28.93	1.488 0891	1747.2	1.19	0.29	3 19.7		
25	9 15	16.36	6.829	16 8	59.8		30.49	1.488 7656	1634.2	1.19	0.29	3 4.4		
29	9 15	44.31	+7.141	+16 6	54.9		-31.95	1.489 3957	+1515.7	1.18	0.29	2 49.1		
July	3	9 16	13.46	+7.432	+16 4	44.3		-33.32	1.489 9775	+1392.8	1.18	0.28	2 33.9	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension.	Var. per Day.	Apparent De lination.	Var. per Day.	Logarithm of Distance from Earth.	Var. per Day.	Semi- diam- eter.	Hor. Paral- lax.	Transit, Meridian of Green- wich.
	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"			"	"	h m
July 3	9 16 13.46	+7.432	+16 4 44.3	-33.32	1.489 9775	+1392.8	1.18	0.28	2 33.9
7	9 16 43.73	7.697	16 2 28.5	34.58	1.490 5092	1264.2	1.18	0.28	2 18.6
11	9 17 15.00	7.937	16 0 7.8	35.71	1.490 9881	1129.5	1.18	0.28	2 3.4
15	9 17 47.19	8.149	15 57 42.8	36.76	1.491 4122	990.2	1.18	0.28	1 48.2
19	9 18 20.15	8.327	15 55 13.9	37.66	1.491 7798	847.3	1.18	0.28	1 33.1
23	9 18 53.77	+8.480	+15 52 41.7	-38.12	1.492 0897	+ 701.7	1.18	0.28	1 17.9
27	9 19 27.95	8.604	15 50 6.7	39.06	1.492 3409	554.3	1.18	0.28	1 2.7
31	9 20 2.56	8.697	15 47 29.4	39.57	1.492 5329	405.0	1.18	0.28	0 47.6
Aug. 4	9 20 37.49	8.766	15 44 50.3	39.96	1.492 6646	253.1	1.18	0.28	0 32.4
8	9 21 12.65	8.805	15 42 9.9	40.22	1.492 7352	+ 99.7	1.18	0.28	0 17.3
12	9 21 47.89	+8.813	+15 39 28.7	-40.34	1.492 7443	- 54.3	1.18	0.28	{ 0 23 58.3
16	9 22 23.11	8.789	15 36 47.4	40.30	1.492 6917	209.0	1.18	0.28	23 43.2
20	9 22 58.16	8.731	15 34 6.5	40.11	1.492 5772	363.2	1.18	0.28	23 28.1
24	9 23 32.92	8.646	15 31 26.7	39.78	1.492 4015	511.4	1.18	0.28	23 12.9
28	9 24 7.29	8.535	15 28 48.4	39.32	1.492 1659	664.3	1.18	0.28	22 57.8
Sept. 1	9 24 41.16	+8.394	+15 26 12.3	-38.74	1.491 8702	- 813.2	1.18	0.28	22 42.6
5	9 25 14.40	8.222	15 23 38.7	38.00	1.491 5156	959.8	1.18	0.28	22 27.4
9	9 25 46.90	8.024	15 21 8.5	37.10	1.491 1027	1103.6	1.18	0.28	22 12.2
13	9 26 18.55	7.792	15 18 42.1	36.06	1.490 6332	1243.5	1.18	0.28	21 57.0
17	9 26 49.20	7.530	15 16 20.2	34.88	1.490 1085	1378.8	1.18	0.28	21 41.8
21	9 27 18.76	+7.244	+15 14 3.2	-33.57	1.489 5310	-1507.5	1.18	0.28	21 26.6
25	9 27 47.12	6.933	15 11 51.8	32.12	1.488 9032	1631.0	1.19	0.29	21 11.3
29	9 28 14.19	6.597	15 9 46.4	30.55	1.488 2269	1749.7	1.19	0.29	20 56.0
Oct. 3	9 28 39.86	6.235	15 7 47.6	28.85	1.487 5043	1861.6	1.19	0.29	20 40.7
7	9 29 4.04	5.851	15 5 55.8	27.02	1.486 7385	1966.8	1.19	0.29	20 25.4
11	9 29 26.63	+5.439	+15 4 11.6	-25.07	1.485 9319	-2061.3	1.19	0.29	20 10.0
15	9 29 47.52	5.004	15 2 35.4	23.00	1.485 0883	2152.2	1.20	0.29	19 54.6
19	9 30 6.64	4.553	15 1 7.7	20.81	1.484 2114	2230.9	1.20	0.29	19 39.2
23	9 30 23.92	4.084	14 59 48.8	18.59	1.483 3049	2299.7	1.20	0.29	19 23.7
27	9 30 39.29	3.600	14 58 39.1	16.25	1.482 3729	2359.1	1.20	0.29	19 8.3
31	9 30 52.70	+3.102	+14 57 38.9	-13.84	1.481 4189	-2403.3	1.21	0.29	18 52.8
Nov. 4	9 31 4.09	2.590	14 56 48.5	11.35	1.480 4469	2448.3	1.21	0.29	18 37.2
8	9 31 13.40	2.064	14 56 8.2	8.81	1.479 4618	2475.9	1.21	0.29	18 21.6
12	9 31 20.59	1.531	14 55 38.1	6.23	1.478 4678	2491.5	1.21	0.29	18 6.0
16	9 31 25.64	0.993	14 55 18.4	3.61	1.477 4703	2493.8	1.22	0.29	17 50.4
20	9 31 28.53	+0.454	+14 55 9.2	- 1.00	1.476 4743	-2484.5	1.22	0.29	17 34.7
24	9 31 29.27	-0.084	14 55 10.4	+ 1.60	1.475 4842	2464.1	1.22	0.29	17 19.0
28	9 31 27.86	0.619	14 55 22.0	4.20	1.474 5047	2430.4	1.23	0.29	17 3.2
Dec. 2	9 31 24.32	1.151	14 55 44.0	6.80	1.473 5413	2385.2	1.23	0.30	16 47.4
6	9 31 18.66	1.678	14 56 16.3	9.32	1.472 5982	2327.5	1.23	0.30	16 31.6
10	9 31 10.91	-2.194	+14 56 58.5	+11.79	1.471 6811	-2255.7	1.23	0.30	16 15.7
14	9 31 1.13	2.691	14 57 50.5	14.19	1.470 7953	2171.7	1.24	0.30	15 59.8
18	9 30 49.41	3.168	14 58 51.9	16.48	1.469 9453	2075.9	1.24	0.30	15 43.9
22	9 30 35.81	3.628	15 0 2.2	18.67	1.469 1360	1969.3	1.24	0.30	15 27.9
26	9 30 20.42	4.062	15 1 21.1	20.72	1.468 3712	1852.6	1.24	0.30	15 12.0
30	9 30 3.35	-4.472	+15 2 47.8	+22.64	1.467 6553	-1725.3	1.25	0.30	14 56.0
34	9 29 44.68	...	+15 4 22.0	...	1.466 9923	...	1.25	0.30	14 39.9

FOR GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Var. per Day.	Reduction to Orbit.	Heliocentric Latitude.	Var. per Day.	Logarithm of Radius Vector.	Var. per Day.
		° ' "	"	"	° ' "	"		
Jan.	4	136 35 55.9	21.66	+ 9.7	+0 10 31.8	+0.67	1.478 2979	+2.8
	14	136 39 32.5	21.66	9.9	0 10 38.5	0.66	1.478 3007	2.8
	24	136 43 9.1	21.66	10.0	0 10 45.1	0.66	1.478 3035	2.8
Feb.	3	136 46 45.7	21.66	+10.1	+0 10 51.8	+0.66	1.478 3063	+2.8
	13	136 50 22.2	21.66	10.2	0 10 58.4	0.66	1.478 3091	2.8
	23	136 53 58.8	21.66	10.3	0 11 5.1	0.66	1.478 3119	2.8
Mar.	5	136 57 35.3	21.65	+10.4	+0 11 11.7	+0.66	1.478 3147	+2.8
	15	137 1 11.8	21.65	10.5	0 11 18.4	0.66	1.478 3175	2.8
	25	137 4 48.3	21.65	10.6	0 11 25.0	0.66	1.478 3203	2.8
Apr.	4	137 8 24.8	21.65	+10.7	+0 11 31.7	+0.66	1.478 3231	+2.8
	14	137 12 1.3	21.65	10.8	0 11 38.3	0.66	1.478 3259	2.8
	24	137 15 37.8	21.65	10.9	0 11 44.9	0.66	1.478 3287	2.8
May	4	137 19 14.3	21.65	+11.0	+0 11 51.5	+0.66	1.478 3315	+2.8
	14	137 22 50.8	21.65	11.1	0 11 58.2	0.66	1.478 3343	2.8
	24	137 26 27.2	21.65	11.2	0 12 4.8	0.66	1.478 3371	2.8
June	3	137 30 3.7	21.65	+11.3	+0 12 11.5	+0.66	1.478 3399	+2.8
	13	137 33 40.1	21.64	11.4	0 12 18.1	0.66	1.478 3427	2.8
	23	137 37 16.6	21.64	11.5	0 12 24.8	0.66	1.478 3455	2.8
July	3	137 40 53.0	21.64	+11.6	+0 12 31.4	+0.66	1.478 3483	+2.8
	13	137 44 29.4	21.64	11.7	0 12 38.0	0.66	1.478 3511	2.8
	23	137 48 5.8	21.64	11.8	0 12 44.6	0.66	1.478 3539	2.8
Aug.	2	137 51 42.2	21.64	+11.9	+0 12 51.3	+0.66	1.478 3567	+2.8
	12	137 55 18.6	21.64	12.0	0 12 57.9	0.66	1.478 3595	2.8
	22	137 58 55.0	21.64	12.1	0 13 4.5	0.66	1.478 3623	2.8
Sept.	1	138 2 31.3	21.64	+12.2	+0 13 11.1	+0.66	1.478 3651	+2.8
	11	138 6 7.7	21.64	12.3	0 13 17.7	0.66	1.478 3679	2.8
	21	138 9 44.0	21.63	12.4	0 13 24.3	0.66	1.478 3707	2.8
Oct.	1	138 13 20.3	21.63	+12.5	+0 13 30.9	+0.66	1.478 3735	+2.8
	11	138 16 56.6	21.63	12.6	0 13 37.5	0.66	1.478 3763	2.8
	21	138 20 32.9	21.63	12.7	0 13 44.2	0.66	1.478 3791	2.8
	31	138 24 9.2	21.63	+12.8	+0 13 50.8	+0.66	1.478 3819	+2.8
Nov.	10	138 27 45.5	21.63	12.9	0 13 57.4	0.66	1.478 3847	2.8
	20	138 31 21.8	21.63	13.0	0 14 4.0	0.66	1.478 3875	2.8
	30	138 34 58.1	21.63	+13.1	+0 14 10.6	+0.66	1.478 3903	+2.8
Dec.	10	138 38 34.3	21.63	13.2	0 14 17.2	0.66	1.478 3931	2.8
	20	138 42 10.6	21.63	13.3	0 14 23.8	0.66	1.478 3959	2.8
	30	138 45 46.8	21.62	+13.4	+0 14 30.4	+0.66	1.478 3988	+2.8
	40	138 49 23.1	21.62	+13.5	+0 14 37.1	+0.66	1.478 4016	+2.8

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

200 FORMULÆ FOR THE REDUCTION OF STARS, 1923.

The constants of precession, nutation, and aberration adopted by the *Conférence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, are given on page xvi, and together with the notation of BESSEL are used in the formulæ which follow.

BESSELIAN STAR-NUMBERS.

<i>Terms of Long Period.</i>	<i>Terms of Short Period.</i>
$A-\tau-0.342\ 22 \sin \Omega$	$-0.004\ 05 \sin 2 \mathfrak{C}$
$+0.004\ 15 \sin 2 \Omega$	$+0.000\ 23 \sin (\mathfrak{C} + \Gamma')$
$-0.025\ 26 \sin 2 L$	$+0.001\ 31 \sin (\mathfrak{C} - \Gamma')$
$+0.002\ 51 \sin (L - \Gamma)$	$-0.000\ 68 \sin (2 \mathfrak{C} - \Omega)$
$-0.000\ 99 \sin (3 L - \Gamma)$	$-0.000\ 52 \sin (3 \mathfrak{C} - \Gamma')$
$+0.000\ 42 \sin (L + \Gamma)$	$+0.000\ 30 \sin (\mathfrak{C} - 2 L + \Gamma')$
$+0.000\ 25 \sin (2 L - \Omega)$	$+0.000\ 12 \sin 2 (\mathfrak{C} - L)$
"	"
$B=-9.210 \cos \Omega$	$-0.088 \cos 2 \mathfrak{C}$
$+0.090 \cos 2 \Omega$	$-0.018 \cos (2 \mathfrak{C} - \Omega)$
$-0.551 \cos 2 L$	$-0.011 \cos (3 \mathfrak{C} - \Gamma')$
$-0.022 \cos (3 L - \Gamma)$	$+0.005 \cos (\mathfrak{C} + \Gamma')$
$+0.009 \cos (L + \Gamma)$	
$+0.007 \cos (2 L - \Omega)$	
$C=-20''.4700 \cos \omega \cos \odot$	
$D=-20''.4700 \sin \odot$	
$E=-0''.0412 \sin \Omega + 0''.0005 \sin 2 \Omega - 0''.0030 \sin 2 L$	

BESSEL'S Star-Constants.

$a=3^s.072\ 76 + 1^s.336\ 33 \sin \alpha_0 \tan \delta_0$	$a'=20''.0449 \cos \alpha_0$
$b=\frac{1}{15} \cos \alpha_0 \tan \delta_0$	$b'=-\sin \alpha_0$
$c=\frac{1}{15} \cos \alpha_0 \sec \delta_0$	$c'=\tan \omega \cos \delta_0 - \sin \alpha_0 \sin \delta_0$
$d=\frac{1}{15} \sin \alpha_0 \sec \delta_0$	$d'=\cos \alpha_0 \sin \delta_0$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + \tau\mu + Aa + Bb + Cc + Dd + \frac{1}{15}E \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + Aa' + Bb' + Cc' + Dd' \quad (\text{in arc})$$

INDEPENDENT STAR-NUMBERS.

$$f + f' = +46''.0914 A + E \quad (\text{in arc})$$

$$= +3^s.07276 A + \frac{1}{15}E \quad (\text{in time})$$

$$f' = -0^s.0124 \sin 2 \mathfrak{C} + 0^s.0041 \sin (\mathfrak{C} - \Gamma') + 0^s.0007 \sin (\mathfrak{C} + \Gamma')$$

$$- 0^s.0021 \sin (2 \mathfrak{C} - \Omega) - 0^s.0016 \sin (3 \mathfrak{C} - \Gamma')$$

$$+ 0^s.0009 \sin (\mathfrak{C} - 2 L + \Gamma') + 0^s.0004 \sin 2 (\mathfrak{C} - L)$$

$$g \sin G = B \qquad h \sin H = C \qquad i = C \tan \omega$$

$$g \cos G = 20''.0449 A \qquad h \cos H = D$$

Formulæ for Reduction to Apparent Position.

$$\alpha = \alpha_0 + f + f' + \tau\mu + \frac{1}{15}g \sin (G + \alpha_0) \tan \delta_0 + \frac{1}{15}h \sin (H + \alpha_0) \sec \delta_0 \quad (\text{in time})$$

$$\delta = \delta_0 + \tau\mu' + g \cos (G + \alpha_0) + h \cos (H + \alpha_0) \sin \delta_0 + i \cos \delta_0 \quad (\text{in arc})$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1923, January 0^d.670, Washington mean time),

$\alpha_0, \delta_0,$ the star's mean R. A. and Decl. at the beginning of the fictitious year,
 $\alpha, \delta,$ the star's apparent right ascension and declination at the time τ ,
 $\mu, \mu',$ the annual proper motion in right ascension and declination,

$\odot,$ the Sun's true longitude,
 $L,$ the Sun's mean longitude,
 $\Omega,$ the longitude of the Moon's ascending node,

$\omega,$ the obliquity of the ecliptic,
 $\Gamma,$ the long. of the Sun's perigee,
 $\Gamma',$ the long. of the Moon's perigee,
 $\mathfrak{C},$ the Moon's mean longitude.

The independent star-numbers are more convenient than BESSEL's when only one or two apparent positions of a star are required, or when BESSEL's star-constants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, $a, b, c, d, a', b', c', d'$, with the star-numbers of this Ephemeris, the quantities to be computed are $Ac, Bd, Ca, Db, -Ac', -Bd', -Ca', -Db'$.

In the computation of the Besselian star-numbers given for Washington mean midnight of each day of the year, on pages 202-205, the short-period terms—that is, the terms involving the Moon's mean longitude—have been included.

In the computation of the independent star-numbers, pages 206-213, the short-period terms have been included in the two columns headed G and $\text{Log } g$. The quantities f and f' give separately the effect of the long-period and short-period terms. f' differs but slightly from the quantity $-0''.1866 \sin 2 \text{ } \epsilon + 0''.0622 \sin (\text{ } \epsilon - \Gamma')$ given on page 37 of the *Procès-Verbaux* of the Paris Conference of 1896, which quantity that conference decided should be omitted in the reduction of stars from mean to apparent place.

In computing the ephemerides of the circumpolar stars in this volume, all short-period terms have been included. The quantity f' , which was omitted from the ephemerides of the circumpolar stars given in the *American Ephemeris and Nautical Almanac* for the years 1900 to 1915, inclusive, is now included in these ephemerides in accordance with the decision of the *Congrès International des Éphémérides Astronomiques* held in Paris in October, 1911. See page 43 of *Procès-Verbaux* of that Congress.

In the computation of the ephemerides of the ten-day stars, no short-period terms have been included. These terms attain two maxima and two minima during the tropical month. At maximum and minimum they may amount in right ascension to $\pm (0''.020 + 0''.008 \tan \delta)$, and in declination to $\pm 0''.13$. For computing the effect of these terms for the correction of the positions of stars interpolated from the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ and $\Delta\delta$ denote the effect of the short-period terms in right ascension and declination, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the nutation in longitude and obliquity:

$$\begin{aligned}\Delta\alpha &= D\psi\alpha \delta''\psi + D\omega\alpha \delta''\omega \\ \Delta\delta &= D\psi\delta \delta''\psi + D\omega\delta \delta''\omega\end{aligned}$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for each day of the year on pages 215-216, and have been computed as follows:

$$\delta''\psi = 50''.37 A_2 \qquad \delta''\omega = -B_2$$

in which A_2 and B_2 are the sums of the short-period terms given in the expressions for A and B on page 200.

The quantities $D\psi\alpha, D\omega\alpha, D\psi\delta$, and $D\omega\delta$ are given for each ten-day star on pages 316-513, and have been computed by means of the following formulæ:

$$\begin{aligned}D\psi\alpha &= \frac{1}{15} (\cos \omega + \sin \alpha \tan \delta \sin \omega) & D\omega\alpha &= -\frac{1}{15} \cos \alpha \tan \delta \\ D\psi\delta &= \cos \alpha \sin \omega & D\omega\delta &= \sin \alpha\end{aligned}$$

In the *Star List of the American Ephemeris* for the years 1910 and 1911 and in the *American Ephemeris and Nautical Almanac* for the years 1912 to 1915, inclusive, the value used for the derivative of the right ascension with reference to ψ was

$$D'\psi\alpha = \frac{1}{15} \sin \alpha \tan \delta \sin \omega$$

and the addition of the term $\frac{1}{15} \cos \omega$ is made in accordance with the above-mentioned decision of the *Congrès International des Éphémérides Astronomiques* of 1911 with reference to the quantity f' .

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Jan. 0	-8.46449	+0.9935	-0.50375	+1.30476	Feb. 15	+9.02198	+0.9518	-1.19490	+1.05276
1	9.38739	0.9936	0.54634	1.30336	16	9.02552	0.9500	1.19986	1.04096
2	8.28847	0.9931	0.58498	1.30182	17	9.02788	0.9486	1.20464	1.02870
3	8.16584	0.9918	0.62035	1.30013	18	9.02999	0.9477	1.20922	1.01595
h 4	8.01787	0.9900	0.65292	1.29830	h 19	9.03230	0.9474	1.21363	1.00268
(7.0) 5	-7.84510	+0.9879	-0.68310	+1.29632	(10.0) 20	+9.03555	+0.9474	-1.21785	+0.98886
6	7.64836	0.9859	0.71119	1.29419	21	9.04054	0.9478	1.22190	0.97446
7	7.41330	0.9845	0.73743	1.29192	22	9.04727	0.9483	1.22577	0.95943
8	-6.98677	0.9838	0.76205	1.28949	23	9.05633	0.9488	1.22948	0.94374
9	+6.89763	0.9840	0.78523	1.28692	24	9.06737	0.9489	1.23302	0.92732
10	+7.49276	+0.9848	-0.80710	+1.28419	25	+9.07940	+0.9484	-1.23640	+0.91012
11	7.79727	0.9858	0.82778	1.28130	26	9.09146	0.9472	1.23962	0.89210
12	8.01157	0.9867	0.84740	1.27826	27	9.10250	0.9453	1.24267	0.87316
13	8.17289	0.9870	0.86603	1.27506	28	9.11119	0.9429	1.24558	0.85322
14	8.29513	0.9865	0.88377	1.27169	Mar. 1	9.11704	0.9404	1.24833	0.83221
15	+8.38721	+0.9853	-0.90064	+1.26816	2	+9.12018	+0.9383	-1.25093	+0.80999
16	8.45530	0.9836	0.91681	1.26447	3	9.12149	0.9369	1.25338	0.78644
17	8.50474	0.9815	0.93224	1.26060	4	9.12222	0.9364	1.25568	0.76143
18	8.53983	0.9793	0.94700	1.25656	5	9.12392	0.9370	1.25784	0.73475
h 19	8.56526	0.9774	0.96114	1.25235	h 6	9.12762	0.9381	1.25986	0.70619
(8.0) 20	+8.58410	+0.9759	-0.97470	+1.24796	(11.0) 7	+9.13408	+0.9394	-1.26173	+0.67551
21	8.59945	0.9748	0.98771	1.24339	8	9.14289	0.9405	1.26346	0.64235
22	8.61416	0.9741	1.00021	1.23863	9	9.15290	0.9409	1.26506	0.60633
23	8.62972	0.9738	1.01222	1.23368	10	9.16295	0.9405	1.26651	0.56692
24	8.64748	0.9739	1.02377	1.22853	11	9.17182	0.9394	1.26783	0.52345
25	+8.66904	+0.9742	-1.03488	+1.22319	12	+9.17889	+0.9377	-1.26901	+0.47502
26	8.69443	0.9746	1.04559	1.21764	13	9.18364	0.9358	1.27006	0.42037
27	8.72370	0.9747	1.05589	1.21189	14	9.18639	0.9340	1.27097	0.35775
28	8.75526	0.9745	1.06583	1.20592	15	9.18766	0.9327	1.27175	0.28441
29	8.78654	0.9736	1.07540	1.19973	16	9.18794	0.9318	1.27240	0.19602
30	+8.81525	+0.9720	-1.08463	+1.19332	17	+9.18800	+0.9316	-1.27292	+0.08482
31	8.83998	0.9697	1.09353	1.18670	18	9.18811	0.9318	1.27330	9.93488
Feb. 1	8.85878	0.9671	1.10212	1.17979	19	9.18887	0.9325	1.27355	9.70396
2	8.87186	0.9644	1.11040	1.17266	20	9.19089	0.9336	1.27367	+9.17796
3	8.88007	0.9622	1.11840	1.16527	21	9.19413	0.9349	1.27366	-9.30929
h 4	+8.88559	+0.9608	-1.12611	+1.15762	h (12.0) 22	+9.19918	+0.9362	-1.27352	-9.74684
(9.0) 5	8.89076	0.9603	1.13355	1.14969	23	9.20545	0.9373	1.27325	9.96015
6	8.89818	0.9606	1.14074	1.14148	24	9.21294	0.9379	1.27285	0.10240
7	8.90950	0.9613	1.14767	1.13298	25	9.22097	0.9378	1.27232	0.20922
8	8.92485	0.9620	1.15436	1.12417	26	9.22861	0.9369	1.27166	0.29472
9	+8.94285	+0.9623	-1.16081	+1.11503	27	+9.23492	+0.9355	-1.27087	-0.36607
10	8.96209	0.9619	1.16703	1.10557	28	9.23942	0.9338	1.26995	0.42701
11	8.98009	0.9607	1.17302	1.09578	29	9.24202	0.9323	1.26890	0.48037
12	8.99555	0.9588	1.17880	1.08561	30	9.24299	0.9315	1.26771	0.52774
13	9.00771	0.9565	1.18437	1.07506	31	9.24343	0.9316	1.26640	0.57032
14	+9.01628	+0.9540	-1.18974	+1.06412	Apr. 1	+9.24433	+0.9327	-1.26495	-0.60895
15	+9.02198	+0.9518	-1.19490	+1.05276	2	+9.24660	+0.9346	-1.26337	-0.64428

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
Apr. 1	+9.24433	+0.9327	-1.26495	-0.60895	May 17	+9.43548	+0.9699	-1.01841	-1.23097
2	9.24660	0.9346	1.26337	0.64428	18	9.44188	0.9709	1.00728	1.23576
3	9.25093	0.9368	1.26166	0.67681	19	9.44838	0.9712	0.99574	1.24037
4	9.25732	0.9389	1.25981	0.70695	20	9.45442	0.9708	0.98376	1.24482
5	9.26507	0.9405	1.25782	0.73499	h 21	9.45956	0.9700	0.97132	1.24909
h 6	+9.27330	+0.9412	-1.25570	-0.76120	(16.0) 22	+9.46356	+0.9689	-0.95840	-1.25320
(13.0) 7	9.28094	0.9411	1.25344	0.78579	23	9.46640	0.9681	0.94496	1.25715
8	9.28728	0.9405	1.25104	0.80893	24	9.46847	0.9680	0.93097	1.26094
9	9.29201	0.9394	1.24851	0.83076	25	9.47046	0.9687	0.91640	1.26457
10	9.29498	0.9385	1.24583	0.85141	26	9.47294	0.9702	0.90120	1.26805
11	+9.29673	+0.9378	-1.24300	-0.87100	27	+9.47650	+0.9723	-0.89532	-1.27138
12	9.29756	0.9376	1.24003	0.88961	28	9.48140	0.9746	0.86873	1.27457
13	9.29805	0.9380	1.23692	0.90732	29	9.48745	0.9766	0.85136	1.27761
14	9.29870	0.9389	1.23365	0.92421	30	9.49423	0.9780	0.83314	1.28050
15	9.29981	0.9403	1.23024	0.94034	31	9.50117	0.9785	0.81400	1.28326
16	+9.30172	+0.9420	-1.22667	-0.95576	June 1	+9.50758	+0.9782	-0.79386	-1.28588
17	9.30473	0.9440	1.22295	0.97052	2	9.51309	0.9774	0.77262	1.28836
18	9.30886	0.9460	1.21907	0.98466	3	9.51749	0.9764	0.75016	1.29070
19	9.31425	0.9478	1.21503	0.99822	4	9.52089	0.9754	0.72636	1.29291
20	9.32071	0.9493	1.21082	1.01125	h 5	9.52349	0.9747	0.70104	1.29499
h 21	+9.32762	+0.9501	-1.20646	-1.02377	(17.0) 6	+9.52562	+0.9745	-0.67404	-1.29694
(14.0) 22	9.33451	0.9502	1.20192	1.03580	7	9.52771	0.9748	0.64512	1.29876
23	9.34062	0.9496	1.19721	1.04739	8	9.52981	0.9755	0.61402	1.30045
24	9.34541	0.9486	1.19232	1.05854	9	9.53225	0.9766	0.58039	1.30201
25	9.34891	0.9477	1.18726	1.06928	10	9.53530	0.9779	0.54381	1.30345
26	+9.35093	+0.9472	-1.18201	-1.07963	11	+9.53896	+0.9793	-0.50373	-1.30476
27	9.35232	0.9475	1.17657	1.08962	12	9.54324	0.9806	0.45946	1.30595
28	9.35376	0.9488	1.17094	1.09926	13	9.54823	0.9817	0.41003	1.30701
29	9.35624	0.9509	1.16512	1.10856	14	9.55360	0.9823	0.35411	1.30795
30	9.36029	0.9534	1.15909	1.11753	15	9.55919	0.9822	0.28976	1.30877
May 1	+9.36601	+0.9560	-1.15286	-1.12620	16	+9.56457	+0.9814	-0.21412	-1.30946
2	9.37303	0.9582	1.14641	1.13457	17	9.56930	0.9801	0.12230	1.31003
3	9.38079	0.9596	1.13974	1.14266	18	9.57316	0.9785	0.00563	1.31048
4	9.38832	0.9602	1.13284	1.15048	19	9.57606	0.9769	9.84542	1.31081
5	9.39496	0.9600	1.12571	1.15803	20	9.57818	0.9758	9.58864	1.31102
h 6	+9.40040	+0.9594	-1.11834	-1.16533	h 21	+9.57999	+0.9756	-8.87624	-1.31111
(15.0) 7	9.40444	0.9587	1.11071	1.17238	(18.0) 22	9.58214	0.9761	+9.37555	1.31108
8	9.40725	0.9583	1.10283	1.17920	23	9.58486	0.9774	9.74030	1.31093
9	9.40934	0.9582	1.09468	1.18579	24	9.58848	0.9789	9.93564	1.31066
10	9.41097	0.9586	1.08624	1.19215	25	9.59305	0.9803	0.06976	1.31027
11	+9.41268	+0.9595	-1.07752	-1.19830	26	+9.59833	+0.9812	+0.17198	-1.30976
12	9.41462	0.9608	1.06850	1.20424	27	9.60379	0.9813	0.25458	1.30912
13	9.41709	0.9625	1.05917	1.20997	28	9.60919	0.9806	0.32383	1.30836
14	9.42037	0.9645	1.04951	1.21550	29	9.61399	0.9792	0.38342	1.30749
15	9.42447	0.9665	1.03950	1.22085	30	9.61796	0.9775	0.43572	1.30649
16	+9.42957	+0.9684	-1.02914	-1.22600	July 1	+9.62106	+0.9757	+0.48229	-1.30537
17	+9.43548	+0.9699	-1.01841	-1.23097	2	+9.62345	+0.9741	+0.52423	-1.30412

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)	Log A.	Log B.	Log C.	Log D.
July 1	+9.62106	+0.9757	+0.48229	-1.30537	Aug. 16	+9.72976	+0.9360	+1.17761	-1.08778
2	9.62345	0.9741	0.52423	1.30412	17	9.73096	0.9367	1.18295	1.07783
3	9.62531	0.9730	0.56237	1.30275	18	9.73285	0.9376	1.18811	1.06752
4	9.62697	0.9724	0.59733	1.30126	19	9.73537	0.9383	1.19309	1.05684
5	9.62865	0.9722	0.62956	1.29964	20	9.73835	0.9383	1.19789	1.04575
h 6	+9.63054	+0.9724	+0.65946	-1.29789	h 21	+9.74145	+0.9374	+1.20253	-1.03424
(19.0) 7	9.63273	0.9730	0.68732	1.29602	(22.0) 22	9.74431	0.9357	1.20699	1.02229
8	9.63540	0.9736	0.71339	1.29401	23	9.74666	0.9334	1.21128	1.00987
9	9.63858	0.9743	0.73787	1.29188	24	9.74836	0.9307	1.21542	0.99696
10	9.64228	0.9747	0.76094	1.28961	25	9.74947	0.9283	1.21939	0.98352
11	+9.64641	+0.9748	+0.78273	-1.28721	26	+9.75012	+0.9262	+1.22321	-0.96951
12	9.65078	0.9742	0.80336	1.28468	27	9.75045	0.9247	1.22688	0.95490
13	9.65506	0.9729	0.82295	1.28201	28	9.75073	0.9238	1.23039	0.93964
14	9.65892	0.9710	0.84158	1.27920	29	9.75107	0.9235	1.23376	0.92370
15	9.66216	0.9687	0.85932	1.27625	30	9.75158	0.9236	1.23698	0.90701
16	+9.66458	+0.9663	+0.87625	-1.27316	31	+9.75240	+0.9240	+1.24005	-0.88952
17	9.66625	0.9643	0.89244	1.26993	Sept. 1	9.75357	0.9246	1.24298	0.87115
18	9.66750	0.9630	0.90793	1.26655	2	9.75513	0.9251	1.24577	0.85183
19	9.66872	0.9626	0.92277	1.26302	3	9.75708	0.9254	1.24842	0.83147
20	9.67029	0.9630	0.93700	1.25934	4	9.75928	0.9251	1.25093	0.80997
h 21	+9.67259	+0.9639	+0.95066	-1.25551	h 5	+9.76163	+0.9242	+1.25331	-0.78720
(20.0) 22	9.67568	0.9648	0.96379	1.25152	(23.0) 6	9.76386	0.9226	1.25555	0.76303
23	9.67946	0.9653	0.97642	1.24738	7	9.76580	0.9204	1.25765	0.73728
24	9.68366	0.9651	0.98858	1.24307	8	9.76720	0.9180	1.25962	0.70976
25	9.68784	0.9640	1.00029	1.23859	9	9.76803	0.9156	1.26146	0.68022
26	+9.69156	+0.9622	+1.01158	-1.23395	10	+9.76838	+0.9138	+1.26317	-0.64838
27	9.69468	0.9599	1.02246	1.22913	11	9.76850	0.9130	1.26475	0.61387
28	9.69706	0.9574	1.03297	1.22414	12	9.76868	0.9132	1.26619	0.57621
29	9.69879	0.9551	1.04311	1.21897	13	9.76924	0.9142	1.26751	0.53482
30	9.70005	0.9532	1.05290	1.21360	14	9.77039	0.9158	1.26870	0.48890
31	+9.70100	+0.9519	+1.06236	-1.20805	15	+9.77218	+0.9173	+1.26976	-0.43738
Aug. 1	9.70193	0.9511	1.07151	1.20230	16	9.77448	0.9182	1.27070	0.37876
2	9.70297	0.9507	1.08035	1.19635	17	9.77700	0.9183	1.27150	0.31076
3	9.70425	0.9507	1.08890	1.19019	18	9.77941	0.9175	1.27218	0.22993
4	9.70584	0.9509	1.09717	1.18382	19	9.78144	0.9159	1.27274	0.13033
h 5	+9.70789	+0.9512	+1.10517	-1.17723	h 20	+9.78291	+0.9140	+1.27316	-0.00058
(21.0) 6	9.71035	0.9514	1.11290	1.17041	(0.0) 21	9.78380	0.9120	1.27346	9.81445
7	9.71324	0.9512	1.12038	1.16335	22	9.78422	0.9104	1.27364	-9.48140
8	9.71635	0.9504	1.12762	1.15605	23	9.78432	0.9095	1.27368	+8.66971
9	9.71952	0.9490	1.13463	1.14850	24	9.78430	0.9091	1.27360	9.59840
10	+9.72245	+0.9469	+1.14140	-1.14070	25	+9.78434	+0.9095	+1.27339	+9.87310
11	9.72491	0.9442	1.14796	1.13262	26	9.78458	0.9103	1.27306	0.04004
12	9.72675	0.9414	1.15429	1.12426	27	9.78506	0.9115	1.27260	0.16030
13	9.72793	0.9389	1.16042	1.11560	28	9.78587	0.9129	1.27200	0.25429
14	9.72859	0.9370	1.16635	1.10665	29	9.78704	0.9143	1.27123	0.33149
15	+9.72910	+0.9360	+1.17208	-1.09738	30	+9.78857	+0.9155	+1.27043	+0.39694
16	+9.72976	+0.9360	+1.17761	-1.08778	Oct. 1	+9.79043	+0.9163	+1.26945	+0.45371

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.
Oct. 1		+9.79043	+0.9163	+1.26945	+0.45371	Nov. 16		+9.85625	+0.9390	+1.04464	+1.21815
2		9.79245	0.9165	1.26834	0.50384	17		9.85699	0.9392	1.03398	1.22364
3		9.79447	0.9160	1.26710	0.54869	18		9.85770	0.9400	1.02292	1.22892
4		9.79627	0.9149	1.26572	0.58925	19		9.85852	0.9414	1.01143	1.23402
h		9.79768	0.9133	1.26421	0.62624	h		9.85956	0.9431	0.99947	1.23892
(1.0)		+9.79862	+0.9117	+1.26256	+0.66023	(4.0)		+9.86087	+0.9450	+0.98704	+1.24363
6		9.79904	0.9106	1.26078	0.69166	21		9.86247	0.9470	0.97410	1.24816
7		9.79923	0.9103	1.25886	0.72086	22		9.86440	0.9489	0.96062	1.25252
8		9.79941	0.9110	1.25680	0.74811	23		9.86660	0.9504	0.94655	1.25670
9		9.79986	0.9127	1.25459	0.77364	24		9.86902	0.9515	0.93188	1.26070
10						25					
11		+9.80088	+0.9151	+1.25225	+0.79765	26		+9.87151	+0.9519	+0.91654	+1.26454
12		9.80252	0.9175	1.24976	0.82029	27		9.87395	0.9517	0.90049	1.26821
13		9.80469	0.9196	1.24712	0.84170	28		9.87613	0.9508	0.88368	1.27171
14		9.80721	0.9209	1.24434	0.86198	29		9.87794	0.9496	0.86604	1.27506
15		9.80974	0.9213	1.24141	0.88124	30		9.87933	0.9486	0.84751	1.27824
16		+9.81196	+0.9208	+1.23832	+0.89957	Dec. 1		+9.88038	+0.9479	+0.82800	+1.28127
17		9.81372	0.9198	1.23508	0.91704	2		9.88126	0.9480	0.80742	1.28414
18		9.81495	0.9186	1.23168	0.93372	3		9.88225	0.9491	0.78566	1.28687
19		9.81568	0.9178	1.22812	0.94966	4		9.88356	0.9510	0.76261	1.28944
h		9.81605	0.9174	1.22440	0.96492	h		9.88538	0.9532	0.73811	1.29186
(2.0)		+9.81629	+0.9177	+1.22051	+0.97954	(5.0)		+9.88775	+0.9553	+0.71199	+1.29413
21		9.81654	0.9186	1.21645	0.99357	6		9.89055	0.9569	0.68404	1.29625
22		9.81696	0.9201	1.21222	1.00703	7		9.89357	0.9577	0.65402	1.29823
23		9.81762	0.9219	1.20781	1.01998	8		9.89652	0.9575	0.62162	1.30006
24		9.81861	0.9240	1.20323	1.03242	9		9.89917	0.9566	0.58644	1.30175
25						10					
26		+9.81991	+0.9261	+1.19846	+1.04440	11		+9.90139	+0.9552	+0.54801	+1.30330
27		9.82157	0.9281	1.19350	1.05594	12		9.90310	0.9538	0.50568	1.30470
28		9.82354	0.9297	1.18834	1.06705	13		9.90444	0.9526	0.45862	1.30597
29		9.82571	0.9307	1.18298	1.07777	14		9.90550	0.9520	0.40566	1.30709
30		9.82794	0.9311	1.17743	1.08810	15		9.90646	0.9519	0.34517	1.30808
31		+9.83005	+0.9308	+1.17166	+1.09807	16		+9.90747	+0.9524	+0.27473	+1.30892
Nov. 1		9.83184	0.9300	1.16568	1.10770	17		9.90861	0.9532	0.19041	1.30963
2		9.83319	0.9290	1.15947	1.11698	18		9.91000	0.9543	0.08547	1.31020
3		9.83414	0.9282	1.15304	1.12596	19		9.91163	0.9555	0.94663	1.31064
4		9.83475	0.9282	1.14637	1.13462	h		9.91352	0.9567	9.74109	1.31093
h		+9.83529	+0.9290	+1.13946	+1.14299	(6.0)		+9.91564	+0.9575	+9.33692	+1.31109
(3.0)		9.83606	0.9308	1.13230	1.15107	21		9.91798	0.9579	-9.06646	1.31111
5		9.83725	0.9334	1.12488	1.15888	22		9.92040	0.9578	9.65347	1.31099
6		9.83906	0.9361	1.11719	1.16642	23		9.92280	0.9569	9.89428	1.31074
7		9.84141	0.9387	1.10922	1.17371	24		9.92499	0.9554	0.04823	1.31035
8						25					
9		+9.84418	+0.9406	+1.10096	+1.18075	26		+9.92690	+0.9534	-0.16156	+1.30982
10		9.84707	0.9415	1.09240	1.18755	27		9.92839	0.9514	0.25124	1.30915
11		9.84979	0.9416	1.08353	1.19411	28		9.92952	0.9497	0.32543	1.30834
12		9.85211	0.9410	1.07433	1.20045	29		9.93042	0.9486	0.38866	1.30740
13		9.85393	0.9402	1.06479	1.20656	30		9.93130	0.9485	0.44374	1.30631
14											
15		+9.85527	+0.9394	+1.05490	+1.21246	31		+9.93237	+0.9492	-0.49248	+1.30509
16		+9.85625	+0.9390	+1.04464	+1.21815	32		+9.93384	+0.9504	-0.53620	+1.30372

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.						
		y	s	s	°	'	h	m	°	'	h	m	
Jan. <													

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .	
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.					
		y	s	s		°	'	°	'			"		
Apr.	1	0.2487	+0.545	-0.007	67	40.0	4	30.7	257 32.9	17 10.2	0.96654	1.27528	-7.98	-0.9022
	2	0.2514	0.550	0.009	67	38.9	4	30.6	256 29.0	17 5.9	0.96848	1.27557	7.95	0.9006
	3	0.2542	0.555	0.008	67	33.0	4	30.2	255 25.2	17 1.7	0.97102	1.27587	7.92	0.8989
	4	0.2569	0.560	-0.005	67	21.0	4	29.4	254 21.5	16 57.4	0.97376	1.27620	7.89	0.8971
	5	0.2596	0.565	0.000	67	3.5	4	28.2	253 17.9	16 53.1	0.97624	1.27653	7.85	0.8951
h (13.0)	6	0.2624	+0.571	+0.005	66	42.1	4	26.8	252 14.5	16 49.0	0.97814	1.27690	-7.82	-0.8930
	7	0.2651	0.576	0.010	66	19.9	4	25.3	251 11.2	16 44.7	0.97930	1.27728	7.77	0.8907
	8	0.2678	0.581	0.014	65	59.3	4	24.0	250 8.0	16 40.5	0.97977	1.27769	7.73	0.8883
	9	0.2706	0.586	0.015	65	42.3	4	22.8	249 5.1	16 36.3	0.97972	1.27811	7.69	0.8858
	10	0.2733	0.592	0.014	65	30.5	4	22.0	248 2.3	16 32.2	0.97941	1.27855	7.64	0.8831
	11	0.2761	+0.597	+0.011	65	23.3	4	21.5	246 59.6	16 28.0	0.97916	1.27899	-7.59	-0.8802
	12	0.2788	0.603	0.006	65	20.3	4	21.4	245 57.1	16 23.8	0.97915	1.27946	7.54	0.8773
	13	0.2815	0.608	+0.002	65	19.9	4	21.3	244 54.8	16 19.7	0.97955	1.27995	7.48	0.8742
	14	0.2843	0.614	-0.003	65	20.7	4	21.4	243 52.6	16 15.5	0.98041	1.28045	7.43	0.8709
	15	0.2870	0.619	0.007	65	21.5	4	21.4	242 50.6	16 11.4	0.98173	1.28097	7.37	0.8675
	16	0.2898	+0.625	-0.010	65	20.9	4	21.4	241 48.8	16 7.3	0.98349	1.28149	-7.31	-0.8639
	17	0.2925	0.631	0.012	65	17.8	4	21.2	240 47.2	16 3.1	0.98564	1.28203	7.25	0.8602
	18	0.2952	0.637	0.012	65	11.5	4	20.8	239 45.7	15 59.0	0.98803	1.28259	7.18	0.8563
	19	0.2980	0.643	0.010	65	0.7	4	20.0	238 44.5	15 55.0	0.99051	1.28315	7.12	0.8523
	20	0.3007	0.649	0.006	64	45.5	4	19.0	237 43.5	15 50.9	0.99284	1.28371	7.05	0.8481
h (14.0)	21	0.3034	+0.655	-0.002	64	26.7	4	17.8	236 42.6	15 46.8	0.99477	1.28430	-6.98	-0.8437
	22	0.3062	0.661	+0.002	64	5.7	4	16.4	235 42.0	15 42.8	0.99614	1.28489	6.91	0.8392
	23	0.3089	0.667	0.005	63	44.8	4	15.0	234 41.6	15 38.8	0.99687	1.28550	6.83	0.8345
	24	0.3116	0.674	0.006	63	26.7	4	13.8	233 41.3	15 34.8	0.99706	1.28609	6.75	0.8296
	25	0.3144	0.680	0.005	63	12.6	4	12.8	232 41.3	15 30.8	0.99699	1.28670	6.68	0.8245
	26	0.3171	+0.687	+0.002	63	4.5	4	12.3	231 41.5	15 26.8	0.99701	1.28731	-6.60	-0.8193
	27	0.3199	0.693	-0.002	63	1.1	4	12.1	230 41.9	15 22.8	0.99754	1.28793	6.51	0.8138
	28	0.3226	0.700	0.007	63	0.5	4	12.0	229 42.4	15 18.8	0.99884	1.28856	6.43	0.8082
	29	0.3253	0.707	0.010	62	59.3	4	12.0	228 43.2	15 14.9	1.00102	1.28920	6.34	0.8024
	30	0.3281	0.714	0.010	62	54.6	4	11.6	227 44.2	15 11.0	1.00390	1.28983	6.26	0.7963
May	1	0.3308	+0.721	-0.008	62	44.5	4	11.0	226 45.4	15 7.0	1.00713	1.29046	-6.17	-0.7901
	2	0.3336	0.728	-0.003	62	28.7	4	9.9	225 46.9	15 3.1	1.01031	1.29108	6.08	0.7837
	3	0.3363	0.735	+0.003	62	8.1	4	8.5	224 48.4	14 59.2	1.01310	1.29171	5.98	0.7770
	4	0.3390	0.742	0.009	61	45.2	4	7.0	223 50.2	14 55.3	1.01523	1.29235	5.89	0.7701
	5	0.3418	0.749	0.013	61	22.8	4	5.5	222 52.2	14 51.5	1.01661	1.29298	5.79	0.7630
	6	0.3445	+0.757	+0.015	61	2.7	4	4.2	221 54.5	14 47.6	1.01743	1.29362	-5.70	-0.7556
	7	0.3472	0.764	0.015	60	46.7	4	3.1	220 56.8	14 43.8	1.01786	1.29425	5.60	0.7480
	8	0.3500	0.772	0.012	60	35.6	4	2.4	219 59.3	14 40.0	1.01817	1.29487	5.50	0.7401
	9	0.3527	0.779	0.008	60	28.2	4	1.9	219 2.0	14 36.1	1.01859	1.29549	5.39	0.7319
	10	0.3555	0.787	+0.004	60	24.0	4	1.6	218 4.9	14 32.3	1.01929	1.29610	5.29	0.7235
	11	0.3582	+0.795	-0.001	60	21.3	4	1.4	217 8.0	14 28.5	1.02036	1.29671	-5.19	-0.7148
	12	0.3609	0.803	0.005	60	19.2	4	1.3	216 11.3	14 24.8	1.02189	1.29732	5.08	0.7058
	13	0.3637	0.811	0.009	60	16.7	4	1.1	215 14.8	14 21.0	1.02380	1.29792	4.97	0.6964
	14	0.3664	0.819	0.011	60	12.1	4	0.8	214 18.5	14 17.2	1.02607	1.29851	4.86	0.6868
	15	0.3692	0.827	0.011	60	5.0	4	0.3	213 22.3	14 13.5	1.02859	1.29910	4.75	0.6768
	16	0.3719	+0.835	-0.010	59	54.0	3	59.6	212 26.3	14 9.8	1.03129	1.29967	-4.64	-0.6664
	17	0.3746	+0.844	-0.007	59	38.9	3	58.6	211 30.4	14 6.0	1.03393	1.30023	-4.53	-0.6557

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f'	G		H					
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.	Log g .	Log h .	i	Log t .
		y	s	s	°	'	h	m	°	'	h	m
May	17	0.3746	+0.844	-0.007	59 38.9	3 58.6	211 30.4	14 6.0	1.03393	1.30023	-4.53	-0.6557
	18	0.3774	0.852	-0.003	59 20.2	3 57.4	210 34.8	14 2.3	1.03632	1.30080	4.41	0.6444
	19	0.3801	0.861	+0.001	58 58.6	3 55.9	209 39.3	13 58.6	1.03825	1.30134	4.30	0.6330
	20	0.3828	0.869	0.005	58 36.1	3 54.4	208 43.9	13 54.9	1.03959	1.30188	4.18	0.6210
	21	0.3856	0.878	0.007	58 14.9	3 53.0	207 48.7	13 51.3	1.04037	1.30240	4.06	0.6086
h (16.0)	22	0.3883	+0.886	+0.006	57 56.9	3 51.8	206 53.7	13 47.6	1.04073	1.30291	-3.94	-0.5956
	23	0.3910	0.895	+0.003	57 44.0	3 50.9	205 58.8	13 43.9	1.04097	1.30342	3.82	0.5822
	24	0.3938	0.904	-0.001	57 36.0	3 50.4	205 4.1	13 40.3	1.04145	1.30391	3.70	0.5682
	25	0.3965	0.913	0.006	57 31.4	3 50.1	204 9.6	13 36.6	1.04252	1.30438	3.58	0.5536
	26	0.3993	0.922	0.010	57 28.0	3 49.7	203 15.1	13 33.0	1.04434	1.30484	3.46	0.5384
	27	0.4020	+0.931	-0.011	57 22.9	3 49.5	202 20.8	13 29.4	1.04689	1.30529	-3.33	-0.5226
	28	0.4047	0.940	0.010	57 13.5	3 48.9	201 26.7	13 25.8	1.04993	1.30573	3.21	0.5060
	29	0.4075	0.949	-0.006	56 58.9	3 47.9	200 32.6	13 22.2	1.05312	1.30614	3.08	0.4886
	30	0.4102	0.958	0.000	56 39.1	3 46.6	199 38.7	13 18.6	1.05609	1.30654	2.95	0.4704
	31	0.4130	0.968	+0.006	56 15.7	3 45.1	198 44.9	13 15.0	1.05857	1.30694	2.83	0.4512
June	1	0.4157	+0.977	+0.011	55 51.3	3 43.4	197 51.2	13 11.4	1.06040	1.30732	-2.70	-0.4311
	2	0.4184	0.986	0.014	55 28.0	3 41.9	196 57.6	13 7.8	1.06160	1.30767	2.57	0.4099
	3	0.4212	0.996	0.015	55 7.8	3 40.5	196 4.1	13 4.3	1.06231	1.30800	2.44	0.3874
	4	0.4239	1.005	0.013	54 51.5	3 39.4	195 10.7	13 0.7	1.06276	1.30833	2.31	0.3636
h (17.0)	5	0.4266	1.015	0.010	54 39.3	3 38.6	194 17.4	12 57.2	1.06319	1.30864	2.18	0.3383
	6	0.4294	+1.024	+0.005	54 30.5	3 38.1	193 24.2	12 53.6	1.06375	1.30894	-2.05	-0.3113
	7	0.4321	1.034	+0.001	54 23.8	3 37.6	192 31.0	12 50.1	1.06466	1.30921	1.92	0.2824
	8	0.4349	1.044	-0.004	54 18.5	3 37.2	191 37.9	12 46.5	1.06583	1.30946	1.78	0.2513
	9	0.4376	1.053	0.008	54 13.4	3 36.9	190 44.9	12 43.0	1.06736	1.30970	1.65	0.2176
	10	0.4403	1.063	0.010	54 6.6	3 36.4	189 52.0	12 39.5	1.06930	1.30992	1.52	0.1811
	11	0.4431	+1.073	-0.011	53 58.4	3 36.0	188 59.1	12 35.9	1.07146	1.31012	-1.38	-0.1410
	12	0.4458	1.083	0.010	53 47.3	3 35.1	188 6.3	12 32.4	1.07382	1.31031	1.25	0.0967
	13	0.4486	1.092	0.007	53 32.5	3 34.2	187 13.5	12 28.9	1.07626	1.31047	1.12	0.0473
	14	0.4513	1.102	-0.004	53 14.3	3 33.0	186 20.8	12 25.4	1.07855	1.31062	0.98	9.9914
	15	0.4540	1.112	+0.001	52 52.9	3 31.5	185 28.1	12 21.9	1.08053	1.31076	0.84	9.9270
	16	0.4568	+1.122	+0.005	52 29.4	3 30.0	184 35.4	12 18.4	1.08203	1.31085	-0.71	-9.8514
	17	0.4595	1.132	0.007	52 6.1	3 28.4	183 42.8	12 14.9	1.08296	1.31094	0.58	9.7596
	18	0.4622	1.142	0.007	51 45.0	3 27.0	182 50.2	12 11.3	1.08342	1.31101	0.44	9.6429
	19	0.4650	1.152	0.005	51 27.9	3 25.9	181 57.7	12 7.8	1.08359	1.31107	0.30	9.4827
	20	0.4677	1.161	+0.001	51 15.6	3 25.0	181 5.1	12 4.3	1.08375	1.31110	0.17	9.2259
h (18.0)	21	0.4704	+1.171	-0.004	51 7.5	3 24.5	180 12.6	12 0.8	1.08428	1.31111	-0.03	-8.5135
	22	0.4732	1.181	0.008	51 1.3	3 24.1	179 20.1	11 57.3	1.08518	1.31111	+0.10	+9.0128
	23	0.4759	1.191	0.011	50 55.6	3 23.7	178 27.6	11 53.8	1.08732	1.31109	0.24	9.3776
	24	0.4787	1.201	0.011	50 47.7	3 23.2	177 35.1	11 50.3	1.08969	1.31105	0.37	9.5729
	25	0.4814	1.211	0.008	50 35.4	3 22.4	176 42.6	11 46.8	1.09237	1.31098	0.51	9.7070
	26	0.4841	+1.221	-0.003	50 18.3	3 21.2	175 50.1	11 43.3	1.09505	1.31091	+0.64	+9.8092
	27	0.4869	1.231	+0.003	49 57.5	3 19.5	174 57.6	11 39.8	1.09735	1.31080	0.78	9.8918
	28	0.4896	1.241	0.008	49 33.6	3 18.2	174 5.0	11 36.3	1.09917	1.31068	0.91	9.9611
	29	0.4924	1.250	0.012	49 9.4	3 16.6	173 12.5	11 32.8	1.10041	1.31055	1.05	0.0207
	30	0.4951	1.260	0.014	48 46.9	3 15.1	172 19.9	11 29.3	1.10112	1.31040	1.18	0.0730
July	1	0.4978	+1.270	+0.014	48 27.7	3 13.8	171 27.2	11 25.8	1.10146	1.31022	+1.32	+0.1195
	2	0.5006	+1.279	+0.011	48 12.2	3 12.8	170 34.5	11 22.3	1.10167	1.31002	+1.45	+0.1615

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	'	°	'	°	'			"	
July	1	0.4978	+1.270	+0.014	48 27.7	3 13.8	171 27.2	11 25.8	1.10146	1.31022	+1.32	+0.1195	
	2	0.5006	1.279	0.011	48 12.2	3 12.8	170 34.5	11 22.3	1.10167	1.31002	1.45	0.1615	
	3	0.5033	1.289	0.007	48 0.6	3 12.0	169 41.7	11 18.8	1.10188	1.30982	1.58	0.1996	
	4	0.5060	1.299	+0.002	47 51.5	3 11.4	168 48.9	11 15.3	1.10228	1.30959	1.72	0.2346	
	5	0.5088	1.308	-0.003	47 44.3	3 11.0	167 56.0	11 11.7	1.10294	1.30934	1.85	0.2668	
h (19.0)	6	0.5115	+1.318	-0.006	47 37.7	3 10.5	167 3.1	11 8.2	1.10392	1.30908	+1.98	+0.2967	
	7	0.5143	1.328	0.009	47 31.1	3 10.1	166 10.1	11 4.7	1.10520	1.30880	2.11	0.3246	
	8	0.5170	1.337	0.011	47 23.2	3 9.5	165 17.0	11 1.1	1.10678	1.30850	2.24	0.3506	
	9	0.5197	1.347	0.010	47 13.2	3 8.9	164 23.9	10 57.6	1.10861	1.30818	2.37	0.3751	
	10	0.5225	1.356	0.008	47 0.4	3 8.0	163 30.6	10 54.0	1.11055	1.30785	2.50	0.3982	
	11	0.5252	+1.366	-0.005	46 44.2	3 6.9	162 37.2	10 50.5	1.11251	1.30750	+2.63	+0.4200	
	12	0.5280	1.375	-0.001	46 24.7	3 5.6	161 43.8	10 46.9	1.11427	1.30714	2.76	0.4406	
	13	0.5307	1.384	+0.004	46 2.8	3 4.2	160 50.3	10 43.4	1.11565	1.30676	2.88	0.4602	
	14	0.5334	1.393	0.007	45 40.0	3 2.7	159 56.7	10 39.8	1.11654	1.30636	3.01	0.4788	
	15	0.5362	1.402	0.008	45 18.0	3 1.2	159 2.9	10 36.2	1.11696	1.30595	3.14	0.4966	
	16	0.5389	+1.412	+0.007	44 59.0	2 59.9	158 9.1	10 32.6	1.11697	1.30553	+3.26	+0.5135	
	17	0.5416	1.421	+0.004	44 44.4	2 59.0	157 15.1	10 29.0	1.11680	1.30509	3.39	0.5297	
	18	0.5444	1.430	-0.001	44 34.4	2 58.3	156 21.1	10 25.4	1.11681	1.30464	3.51	0.5452	
	19	0.5471	1.439	0.006	44 27.9	2 57.9	155 26.9	10 21.8	1.11722	1.30418	3.63	0.5600	
	20	0.5498	1.447	0.010	44 23.4	2 57.6	154 32.6	10 18.2	1.11823	1.30370	3.75	0.5742	
h (20.0)	21	0.5526	+1.456	-0.011	44 17.7	2 57.2	153 38.2	10 14.5	1.11982	1.30321	+3.87	+0.5879	
	22	0.5553	1.465	0.009	44 9.2	2 56.6	152 43.6	10 10.9	1.12187	1.30271	3.99	0.6010	
	23	0.5581	1.473	-0.005	43 56.2	2 55.7	151 48.9	10 7.3	1.12406	1.30220	4.11	0.6137	
	24	0.5608	1.482	0.000	43 38.8	2 54.6	150 54.1	10 3.6	1.12616	1.30166	4.22	0.6258	
	25	0.5635	1.491	+0.006	43 18.0	2 53.2	149 59.1	9 59.9	1.12784	1.30112	4.34	0.6375	
	26	0.5663	+1.499	+0.011	42 56.0	2 51.7	149 4.0	9 56.3	1.12896	1.30058	+4.46	+0.6488	
	27	0.5690	1.507	0.013	42 34.4	2 50.3	148 8.7	9 52.6	1.12956	1.30003	4.57	0.6597	
	28	0.5718	1.515	0.013	42 15.4	2 49.0	147 13.3	9 48.9	1.12975	1.29947	4.68	0.6702	
	29	0.5745	1.524	0.011	41 59.5	2 48.0	146 17.8	9 45.2	1.12966	1.29889	4.79	0.6804	
	30	0.5772	1.532	0.008	41 47.1	2 47.1	145 22.0	9 41.5	1.12951	1.29830	4.90	0.6902	
	31	0.5800	+1.540	+0.003	41 38.1	2 46.5	144 26.1	9 37.7	1.12945	1.29771	+5.01	+0.6996	
	Aug.	1	0.5827	1.548	-0.002	41 31.3	2 46.1	143 30.0	9 34.0	1.12962	1.29712	5.11	0.7088
		2	0.5854	1.556	0.006	41 25.8	2 45.7	142 33.7	9 30.2	1.13005	1.29652	5.22	0.7176
		3	0.5882	1.563	0.009	41 20.8	2 45.4	141 37.3	9 26.5	1.13077	1.29591	5.32	0.7262
		4	0.5909	1.571	0.011	41 15.4	2 45.0	140 40.7	9 22.7	1.13176	1.29530	5.42	0.7344
h (21.0)	5	0.5937	+1.579	-0.011	41 8.4	2 44.6	139 43.9	9 18.9	1.13303	1.29469	+5.53	+0.7424	
	6	0.5964	1.586	0.010	40 59.4	2 44.0	138 47.0	9 15.1	1.13450	1.29406	5.62	0.7502	
	7	0.5991	1.594	0.007	40 47.3	2 43.2	137 49.8	9 11.3	1.13607	1.29343	5.72	0.7576	
	8	0.6019	1.601	-0.002	40 32.2	2 42.1	136 52.4	9 7.5	1.13754	1.29281	5.82	0.7649	
	9	0.6046	1.608	+0.002	40 14.3	2 41.0	135 54.9	9 3.7	1.13879	1.29219	5.91	0.7719	
	10	0.6073	+1.615	+0.006	39 54.7	2 39.6	134 57.2	8 59.8	1.13964	1.29156	+6.01	+0.7786	
	11	0.6101	1.622	0.008	39 34.8	2 38.3	133 59.3	8 56.0	1.14001	1.29093	6.10	0.7852	
	12	0.6128	1.629	0.008	39 16.7	2 37.1	133 1.2	8 52.1	1.13997	1.29030	6.19	0.7915	
	13	0.6156	1.636	0.005	39 2.2	2 36.1	132 2.9	8 48.2	1.13965	1.28968	6.28	0.7977	
	14	0.6183	1.643	+0.001	38 52.4	2 35.5	131 4.5	8 44.3	1.13931	1.28906	6.36	0.8036	
	15	0.6210	+1.650	-0.004	38 46.7	2 35.1	130 5.8	8 40.4	1.13924	1.28844	+6.45	+0.8093	
	16	0.6238	+1.657	-0.008	38 44.0	2 34.9	129 7.0	8 36.5	1.13963	1.28783	+6.53	+0.8149	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
		y	s	s		°	'	°	'			"	
Aug. 16	0.6238	+1.657	-0.008	38 44.0	2 34.9	129 7.0	8 36.5	1.13963	1.28783	+6.53	+0.8149		
17	0.6265	1.663	0.010	38 42.0	2 34.8	128 8.0	8 32.5	1.14063	1.28721	6.61	0.8202		
18	0.6292	1.670	0.009	38 38.2	2 34.5	127 8.7	8 28.6	1.14213	1.28659	6.69	0.8254		
19	0.6320	1.676	0.006	38 31.1	2 34.1	126 9.3	8 24.6	1.14394	1.28599	6.77	0.8303		
20	0.6347	1.682	-0.001	38 19.7	2 33.3	125 9.8	8 20.7	1.14577	1.28541	6.84	0.8351		
h 21	0.6375	+1.689	+0.005	38 4.4	2 32.3	124 10.0	8 16.7	1.14735	1.28481	+6.92	+0.8398		
(22.0) 22	0.6402	1.696	0.010	37 46.8	2 31.1	123 10.1	8 12.7	1.14848	1.28423	6.99	0.8442		
23	0.6429	1.701	0.013	37 28.9	2 29.9	122 10.0	8 8.7	1.14909	1.28365	7.06	0.8485		
24	0.6457	1.707	0.014	37 12.4	2 28.8	121 9.7	8 4.6	1.14920	1.28309	7.12	0.8527		
25	0.6484	1.713	0.012	36 58.8	2 27.9	120 9.2	8 0.6	1.14901	1.28253	7.19	0.8566		
26	0.6512	+1.719	+0.009	36 48.4	2 27.2	119 8.6	7 56.6	1.14867	1.28199	+7.25	+0.8605		
27	0.6539	1.725	+0.004	36 41.4	2 26.8	118 7.7	7 52.5	1.14834	1.28146	7.31	0.8641		
28	0.6566	1.730	0.000	36 37.1	2 26.5	117 6.7	7 48.4	1.14822	1.28094	7.37	0.8676		
29	0.6594	1.736	-0.005	36 34.5	2 26.3	116 5.5	7 44.4	1.14831	1.28044	7.43	0.8710		
30	0.6621	1.742	0.008	36 33.1	2 26.2	115 4.1	7 40.3	1.14869	1.27995	7.49	0.8742		
31	0.6648	+1.747	-0.010	36 31.6	2 26.1	114 2.6	7 36.2	1.14937	1.27947	+7.54	+0.8773		
Sept. 1	0.6676	1.753	0.011	36 29.3	2 26.0	113 0.9	7 32.1	1.15033	1.27900	7.59	0.8802		
2	0.6703	1.758	0.011	36 25.4	2 25.7	111 59.0	7 27.9	1.15152	1.27855	7.64	0.8830		
3	0.6730	1.763	0.008	36 19.0	2 25.3	110 57.0	7 23.8	1.15288	1.27812	7.68	0.8857		
4	0.6758	1.769	-0.004	36 9.7	2 24.6	109 54.8	7 19.7	1.15421	1.27770	7.73	0.8882		
h 5	0.6785	+1.774	0.000	35 57.6	2 23.8	108 52.5	7 15.5	1.15545	1.27731	+7.77	+0.8906		
(23.0) 6	0.6813	1.779	+0.004	35 43.2	2 22.9	107 50.0	7 11.3	1.15637	1.27694	7.81	0.8928		
7	0.6840	1.785	0.007	35 27.7	2 21.8	106 47.4	7 7.2	1.15690	1.27657	7.85	0.8949		
8	0.6867	1.790	0.007	35 13.1	2 20.9	105 44.7	7 3.0	1.15700	1.27623	7.89	0.8969		
9	0.6895	1.795	0.006	35 1.2	2 20.1	104 41.8	6 58.8	1.15677	1.27590	7.92	0.8987		
10	0.6922	+1.800	+0.002	34 53.2	2 19.5	103 38.8	6 54.6	1.15642	1.27560	+7.95	+0.9004		
11	0.6950	1.805	-0.002	34 49.7	2 19.3	102 35.6	6 50.4	1.15623	1.27533	7.98	0.9020		
12	0.6977	1.810	0.007	34 49.7	2 19.3	101 32.4	6 46.2	1.15641	1.27507	8.01	0.9034		
13	0.7004	1.815	0.009	34 51.7	2 19.4	100 29.1	6 41.9	1.15714	1.27483	8.03	0.9048		
14	0.7032	1.819	0.009	34 53.2	2 19.5	99 25.7	6 37.7	1.15843	1.27460	8.05	0.9060		
15	0.7059	+1.824	-0.007	34 52.0	2 19.5	98 22.1	6 33.5	1.16011	1.27441	+8.07	+0.9070		
16	0.7086	1.829	-0.002	34 46.9	2 19.1	97 18.5	6 29.2	1.16196	1.27424	8.09	0.9080		
17	0.7114	1.834	+0.004	34 38.0	2 18.5	96 14.9	6 25.0	1.16370	1.27409	8.11	0.9088		
18	0.7141	1.839	0.009	34 26.0	2 17.7	95 11.1	6 20.7	1.16507	1.27396	8.12	0.9094		
19	0.7169	1.844	0.013	34 12.9	2 16.9	94 7.2	6 16.5	1.16597	1.27386	8.13	0.9100		
h 20	0.7196	+1.848	+0.015	34 0.2	2 16.0	93 3.3	6 12.2	1.16636	1.27378	+8.14	+0.9104		
(0.0) 21	0.7223	1.853	0.014	33 49.9	2 15.3	91 59.4	6 8.0	1.16637	1.27372	8.14	0.9107		
22	0.7251	1.858	0.011	33 42.5	2 14.8	90 55.5	6 3.7	1.16616	1.27370	8.14	0.9109		
23	0.7278	1.863	0.006	33 38.6	2 14.6	89 51.5	5 59.4	1.16593	1.27368	8.15	0.9109		
24	0.7306	1.867	+0.001	33 37.5	2 14.5	88 47.4	5 55.2	1.16582	1.27370	8.14	0.9108		
25	0.7333	+1.872	-0.003	33 38.5	2 14.6	87 43.3	5 50.9	1.16595	1.27373	+8.14	+0.9106		
26	0.7360	1.877	0.007	33 40.6	2 14.7	86 39.2	5 46.6	1.16636	1.27380	8.13	0.9103		
27	0.7388	1.882	0.010	33 43.3	2 14.9	85 35.1	5 42.3	1.16707	1.27389	8.13	0.9098		
28	0.7415	1.887	0.011	33 45.4	2 15.0	84 31.0	5 38.1	1.16806	1.27399	8.11	0.9092		
29	0.7442	1.891	0.011	33 46.3	2 15.1	83 26.9	5 33.8	1.16930	1.27412	8.10	0.9085		
30	0.7474	+1.896	-0.009	33 45.3	2 15.0	82 22.7	5 29.5	1.17075	1.27428	+8.08	+0.9077		
Oct. 1	0.7497	+1.901	-0.006	33 41.4	2 14.7	81 18.5	5 25.2	1.17228	1.27447	+8.07	+0.9067		

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sideral Hour.)	τ	f		f'		G		H		Log g .	Log h .	i	Log i .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
		y	s	s		°	'	°	'			"	
Oct.	1	0.7497	+1.901	-0.006	33 41.4	2 14.7	81 18.5	5 25.2	1.17228	1.27447	+8.07	+0.9067	
	2	0.7524	1.906	-0.002	33 34.8	2 14.3	80 14.5	5 21.0	1.17374	1.27467	8.05	0.9056	
	3	0.7552	1.911	+0.002	33 25.5	2 13.7	79 10.4	5 16.7	1.17499	1.27490	8.02	0.9044	
	4	0.7579	1.916	0.005	33 14.7	2 13.0	78 6.3	5 12.4	1.17589	1.27515	8.00	0.9030	
	5	0.7607	1.921	0.006	33 4.0	2 12.3	77 2.3	5 8.2	1.17642	1.27542	7.97	0.9015	
	6	0.7634	+1.926	+0.005	32 54.8	2 11.7	75 58.3	5 3.9	1.17660	1.27571	+7.94	+0.8998	
	7	0.7661	1.931	+0.002	32 49.2	2 11.3	74 54.4	4 59.6	1.17657	1.27603	7.91	0.8980	
	8	0.7689	1.936	-0.002	32 47.4	2 11.2	73 50.5	4 55.4	1.17661	1.27636	7.87	0.8961	
	9	0.7716	1.941	0.006	32 49.5	2 11.3	72 46.7	4 51.1	1.17696	1.27672	7.84	0.8940	
	10	0.7744	1.946	0.010	32 54.0	2 11.6	71 43.0	4 46.7	1.17778	1.27709	7.80	0.8918	
	11	0.7771	+1.952	-0.010	32 58.8	2 11.9	70 39.3	4 42.6	1.17919	1.27749	+7.75	+0.8895	
	12	0.7798	1.957	0.008	33 1.8	2 12.1	69 35.7	4 38.4	1.18107	1.27790	7.71	0.8870	
	13	0.7826	1.963	-0.004	33 1.4	2 12.1	68 32.2	4 34.1	1.18321	1.27833	7.66	0.8844	
	14	0.7853	1.968	+0.002	32 57.0	2 11.8	67 28.8	4 29.9	1.18537	1.27879	7.61	0.8816	
	15	0.7880	1.973	0.008	32 49.2	2 11.3	66 25.6	4 25.7	1.18727	1.27925	7.56	0.8787	
h (1.0)	16	0.7908	+1.979	+0.013	32 39.5	2 10.6	65 22.4	4 21.5	1.18870	1.27974	+7.51	+0.8756	
	17	0.7935	1.985	0.015	32 29.5	2 10.0	64 19.3	4 17.3	1.18965	1.28024	7.45	0.8723	
	18	0.7963	1.991	0.015	32 21.0	2 9.4	63 16.3	4 13.1	1.19020	1.28076	7.40	0.8689	
	19	0.7990	1.996	0.013	32 15.2	2 9.0	62 13.5	4 8.9	1.19047	1.28128	7.33	0.8654	
	20	0.8017	2.002	0.009	32 12.7	2 8.8	61 10.8	4 4.7	1.19064	1.28182	7.27	0.8616	
	21	0.8045	+2.008	+0.004	32 12.9	2 8.9	60 8.2	4 0.5	1.19089	1.28238	+7.21	+0.8578	
	22	0.8072	2.014	-0.001	32 15.3	2 9.0	59 5.8	3 56.4	1.19133	1.28295	7.14	0.8537	
	23	0.8100	2.020	0.005	32 19.0	2 9.3	58 3.5	3 52.2	1.19205	1.28352	7.07	0.8495	
	24	0.8127	2.026	0.008	32 23.4	2 9.6	57 1.3	3 48.1	1.19306	1.28411	7.00	0.8451	
	25	0.8154	2.033	0.010	32 27.2	2 9.8	55 59.3	3 44.0	1.19436	1.28472	6.93	0.8405	
	26	0.8182	+2.039	-0.010	32 30.1	2 10.0	54 57.3	3 39.8	1.19589	1.28533	+6.85	+0.8357	
	27	0.8209	2.045	0.009	32 31.1	2 10.1	53 55.5	3 35.7	1.19763	1.28595	6.77	0.8308	
	28	0.8236	2.052	0.006	32 29.7	2 10.0	52 53.9	3 31.6	1.19949	1.28657	6.69	0.8256	
	29	0.8264	2.059	-0.003	32 25.9	2 9.7	51 52.4	3 27.5	1.20135	1.28720	6.61	0.8202	
	30	0.8291	2.065	+0.001	32 19.1	2 9.3	50 51.1	3 23.4	1.20304	1.28784	6.53	0.8147	
Nov.	31	0.8318	+2.072	+0.004	32 10.6	2 8.7	49 49.9	3 19.3	1.20447	1.28848	+6.44	+0.8089	
	1	0.8346	2.079	0.006	32 1.3	2 8.1	48 48.8	3 15.3	1.20552	1.28913	6.35	0.8029	
	2	0.8373	2.086	0.005	31 52.9	2 7.5	47 47.9	3 11.2	1.20621	1.28978	6.26	0.7967	
	3	0.8401	2.093	+0.003	31 46.9	2 7.1	46 47.1	3 7.1	1.20669	1.29044	6.17	0.7903	
	4	0.8428	2.100	-0.001	31 44.5	2 7.0	45 46.5	3 3.1	1.20711	1.29109	6.08	0.7836	
	5	0.8455	+2.108	-0.006	31 45.6	2 7.0	44 46.0	2 59.1	1.20774	1.29174	+5.98	+0.7767	
	6	0.8483	2.115	0.010	31 49.2	2 7.3	43 45.7	2 55.0	1.20879	1.29240	5.88	0.7696	
	7	0.8510	2.123	0.012	31 54.0	2 7.6	42 45.6	2 51.0	1.21036	1.29306	5.78	0.7621	
	8	0.8538	2.130	0.010	31 57.4	2 7.8	41 45.6	2 47.0	1.21243	1.29372	5.68	0.7544	
	9	0.8565	2.138	0.007	31 58.1	2 7.9	40 45.7	2 43.0	1.21484	1.29437	5.58	0.7465	
	10	0.8592	+2.146	-0.001	31 55.0	2 7.7	39 46.0	2 39.1	1.21737	1.29502	+5.47	+0.7382	
	11	0.8620	2.154	+0.006	31 48.2	2 7.2	38 46.4	2 35.1	1.21972	1.29566	5.37	0.7296	
	12	0.8647	2.162	0.011	31 38.9	2 6.6	37 47.0	2 31.1	1.22171	1.29630	5.26	0.7208	
	13	0.8674	2.170	0.015	31 28.4	2 5.9	36 47.7	2 27.2	1.22327	1.29693	5.15	0.7116	
	14	0.8702	2.178	0.016	31 19.1	2 5.3	35 48.6	2 23.2	1.22433	1.29756	5.04	0.7020	
h (3.0)	15	0.8729	+2.186	+0.014	31 11.7	2 4.8	34 49.6	2 19.3	1.22510	1.29818	+4.92	+0.6922	
	16	0.8757	+2.195	+0.011	31 7.0	2 4.5	33 50.8	2 15.4	1.22572	1.29879	+4.81	+0.6819	

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f		f'		g		H		Log g .	Log h .	i	Log t .
		In Time.		In Time.		In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	s	°	'	h	m	°	'	h	m	"
Nov.	16	0.8757	+2.195	+0.011	31	7.0	2 4.5	33 50.8	2 15.4	1.22572	1.29879	+4.81	+0.6819
	17	0.8784	2.203	0.006	31	5.1	2 4.3	32 52.1	2 11.5	1.22631	1.29940	4.69	0.6712
	18	0.8811	2.212	+0.001	31	5.5	2 4.4	31 53.6	2 7.6	1.22705	1.30000	4.57	0.6602
	19	0.8839	2.221	-0.004	31	7.2	2 4.5	30 55.2	2 3.7	1.22800	1.30059	4.45	0.6487
	20	0.8866	2.229	0.007	31	9.6	2 4.6	29 57.0	1 59.8	1.22923	1.30117	4.33	0.6367
h (4.0)	21	0.8894	+2.238	-0.009	31	11.8	2 4.8	28 58.9	1 55.9	1.23070	1.30173	+4.21	+0.6243
	22	0.8921	2.247	0.010	31	13.1	2 4.9	28 0.9	1 52.1	1.23241	1.30228	4.09	0.6114
	23	0.8948	2.256	0.009	31	12.9	2 4.9	27 3.0	1 48.2	1.23432	1.30283	3.96	0.5979
	24	0.8976	2.265	0.007	31	10.7	2 4.7	26 5.2	1 44.3	1.23635	1.30336	3.84	0.5838
	25	0.9003	2.275	-0.003	31	6.0	2 4.4	25 7.6	1 40.5	1.23841	1.30388	3.71	0.5691
	26	0.9030	+2.284	+0.001	30	58.8	2 3.9	24 10.1	1 36.7	1.24035	1.30438	+3.58	+0.5538
	27	0.9058	2.293	0.004	30	49.4	2 3.3	23 12.7	1 32.8	1.24208	1.30487	3.45	0.5377
	28	0.9085	2.303	0.006	30	38.8	2 2.6	22 15.4	1 29.0	1.24347	1.30533	3.32	0.5209
	29	0.9112	2.312	0.006	30	28.5	2 1.9	21 18.1	1 25.2	1.24451	1.30580	3.19	0.5033
	30	0.9140	2.322	+0.004	30	19.9	2 1.3	20 21.0	1 21.3	1.24526	1.30623	3.05	0.4848
Dec.	1	0.9167	+2.332	0.000	30	14.0	2 0.9	19 24.0	1 17.6	1.24588	1.30666	+2.92	+0.4652
	2	0.9195	2.341	-0.005	30	11.5	2 0.8	18 27.0	1 13.8	1.24657	1.30706	2.78	0.4447
	3	0.9222	2.351	0.010	30	11.8	2 0.8	17 30.2	1 10.0	1.24758	1.30746	2.65	0.4229
	4	0.9249	2.361	0.012	30	13.6	2 0.9	16 33.4	1 6.2	1.24903	1.30783	2.51	0.3999
h (5.0)	5	0.9277	2.371	0.012	30	15.0	2 1.0	15 36.7	1 2.4	1.25095	1.30819	2.37	0.3754
	6	0.9304	+2.381	-0.010	30	14.2	2 0.9	14 40.0	0 58.7	1.25326	1.30852	+2.24	+0.3492
	7	0.9332	2.391	-0.004	30	10.1	2 0.7	13 43.5	0 54.9	1.25576	1.30883	2.10	0.3213
	8	0.9359	2.401	+0.002	30	2.3	2 0.2	12 47.0	0 51.1	1.25821	1.30912	1.96	0.2913
	9	0.9386	2.412	0.009	29	51.7	1 59.4	11 50.5	0 47.4	1.26039	1.30940	1.82	0.2589
	10	0.9414	2.422	0.013	29	39.5	1 58.6	10 54.1	0 43.6	1.26215	1.30966	1.67	0.2237
	11	0.9441	+2.432	+0.015	29	27.3	1 57.8	9 57.8	0 39.9	1.26350	1.30990	+1.53	+0.1853
	12	0.9468	2.442	0.015	29	16.6	1 57.1	9 1.5	0 36.1	1.26445	1.31011	1.39	0.1429
	13	0.9496	2.452	0.012	29	8.2	1 56.5	8 5.3	0 32.4	1.26519	1.31031	1.25	0.0959
	14	0.9523	2.463	0.008	29	2.4	1 56.2	7 9.1	0 28.6	1.26585	1.31048	1.10	0.0429
	15	0.9551	2.473	+0.003	28	59.0	1 55.9	6 13.0	0 24.9	1.26657	1.31064	0.96	9.9824
	16	0.9578	+2.484	-0.002	28	57.1	1 55.8	5 16.9	0 21.1	1.26745	1.31077	+0.82	+9.9120
	17	0.9605	2.494	0.006	28	56.2	1 55.7	4 20.8	0 17.4	1.26852	1.31088	0.67	9.8277
	18	0.9633	2.504	0.008	28	55.3	1 55.7	3 24.7	0 13.6	1.26984	1.31097	0.53	9.7227
	19	0.9660	2.515	0.009	28	53.8	1 55.6	2 28.6	0 9.9	1.27138	1.31105	0.38	9.5839
	20	0.9688	2.526	0.009	28	51.2	1 55.4	1 32.5	0 6.2	1.27308	1.31109	0.24	9.3783
h (6.0)	21	0.9715	+2.536	-0.007	28	47.0	1 55.1	0 36.5	0 2.4	1.27491	1.31112	+0.09	+8.9742
	22	0.9742	2.546	-0.004	28	40.6	1 54.7	359 40.5	23 58.7	1.27681	1.31112	-0.05	-8.7037
	23	0.9770	2.557	0.000	28	32.0	1 54.1	358 44.4	23 55.0	1.27864	1.31110	0.20	9.2907
	24	0.9797	2.567	+0.004	28	21.1	1 53.4	357 48.3	23 51.2	1.28030	1.31106	0.34	9.5315
	25	0.9824	2.578	0.006	28	8.9	1 52.6	356 52.2	23 47.5	1.28165	1.31100	0.48	9.6855
	26	0.9852	+2.588	+0.007	27	56.3	1 51.8	355 56.1	23 43.7	1.28268	1.31091	-0.63	-9.7988
	27	0.9879	2.599	0.006	27	44.7	1 51.0	354 59.9	23 40.0	1.28343	1.31081	0.77	9.8885
	28	0.9906	2.609	+0.002	27	35.4	1 50.4	354 3.7	23 36.2	1.28395	1.31068	0.92	9.9627
	29	0.9934	2.619	-0.003	27	29.2	1 50.0	353 7.5	23 32.5	1.28444	1.31054	1.06	0.0259
	30	0.9961	2.630	0.008	27	25.7	1 49.7	352 11.2	23 28.7	1.28509	1.31036	1.20	0.0810
	31	0.9989	+2.640	-0.012	27	24.5	1 49.6	351 14.9	23 25.0	1.28608	1.31017	-1.35	-0.1297
	32	1.0016	+2.650	-0.013	27	23.7	1 49.6	350 18.6	23 21.2	1.28750	1.30997	-1.49	-0.1734

214 BESSELIAN AND INDEPENDENT STAR-NUMBERS, 1923.

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A ₁ .	Log B ₁ .	Log C.	Log D.	f	G ₁	H	Log g ₁ .	Log h.	Log i.
					s	° ' "	° ' "			
Jan. 0.72	-8.4094	+0.9907	-0.5136	+1.3045	-0.079	93 1	350 48	0.9913	1.3101	-0.1508
10.69	+7.8287	0.9859	0.8112	1.2836	+0.021	89 12	341 23	0.9859	1.3070	0.4484
20.67	8.5690	0.9784	0.9769	1.2472	0.114	85 32	331 47	0.9797	1.3022	0.6142
30.64	8.8096	0.9692	1.0859	1.1924	0.198	82 6	321 57	0.9734	1.2961	0.7231
Feb. 9.61	8.9489	0.9593	1.1615	1.1140	0.273	78 56	311 52	0.9675	1.2896	0.7987
19.59	+9.0416	+0.9498	-1.2140	+1.0015	+0.338	76 6	301 31	0.9627	1.2833	-0.8513
Mar. 1.56	9.1089	0.9419	1.2485	0.8310	0.394	73 36	290 56	0.9599	1.2781	0.8858
11.53	9.1615	0.9365	1.2679	+0.5220	0.445	71 24	280 11	0.9598	1.2748	0.9051
21.50	9.2055	0.9343	1.2737	-9.3115	0.493	69 29	269 23	0.9628	1.2737	0.9109
31.48	9.2456	0.9354	1.2664	0.5694	0.540	67 44	258 38	0.9691	1.2750	0.9037
Apr. 10.45	+9.2848	+0.9395	-1.2460	-0.8504	+0.592	66 4	248 6	0.9785	1.2785	-0.8832
20.42	9.3247	0.9458	1.2112	1.0102	0.649	64 23	237 48	0.9908	1.2837	0.8484
30.39	9.3660	0.9535	1.1597	1.1166	0.713	62 37	227 50	1.0052	1.2898	0.7969
May 10.37	9.4084	0.9616	1.0874	1.1913	0.786	60 43	218 12	1.0210	1.2960	0.7246
20.34	9.4513	0.9688	0.9857	1.2441	0.868	58 40	208 53	1.0373	1.3018	0.6229
30.31	+9.4936	+0.9746	-0.8366	-1.2800	+0.957	56 29	199 49	1.0536	1.3065	-0.4739
June 9.29	9.5345	0.9782	0.5878	1.3017	1.051	54 11	190 56	1.0692	1.3096	0.2251
19.26	9.5731	0.9792	-9.8900	1.3107	1.149	51 48	182 10	1.0839	1.3111	-9.5273
29.23	9.6088	0.9774	+0.3682	1.3077	1.248	49 23	173 27	1.0972	1.3106	+0.0055
July 9.20	9.6411	0.9730	0.7308	1.2925	1.344	46 58	164 40	1.1091	1.3083	0.3680
19.18	+9.6697	+0.9661	+0.9180	-1.2642	+1.436	44 38	155 45	1.1195	1.3043	+0.5552
29.15	9.6947	0.9573	1.0396	1.2208	1.521	42 24	146 37	1.1285	1.2991	0.6768
Aug. 8.12	9.7163	0.9474	1.1249	1.1588	1.598	40 20	137 14	1.1362	1.2931	0.7622
18.09	9.7346	0.9371	1.1861	1.0718	1.667	38 30	127 33	1.1430	1.2868	0.8233
28.07	9.7502	0.9275	1.2289	0.9463	1.728	36 53	117 33	1.1492	1.2812	0.8661
Sept. 7.04	+9.7636	+0.9197	+1.2567	-0.7494	+1.782	35 33	107 16	1.1552	1.2767	+0.8939
17.01	9.7756	0.9145	1.2711	-0.3453	1.832	34 29	96 46	1.1615	1.2742	0.9084
26.98	9.7867	0.9125	1.2728	+0.1024	1.879	33 41	86 8	1.1685	1.2738	0.9101
Oct. 6.96	9.7979	0.9139	1.2618	0.6749	1.928	33 5	75 29	1.1767	1.2758	0.8990
16.93	9.8097	0.9183	1.2370	0.9072	1.982	32 39	64 55	1.1864	1.2800	0.8742
26.90	+9.8227	+0.9251	+1.1965	+1.0491	+2.041	32 16	54 32	1.1976	1.2856	+0.8337
Nov. 5.88	9.8371	0.9332	1.1368	1.1461	2.111	31 54	44 23	1.2102	1.2920	0.7741
15.85	9.8530	0.9413	1.0514	1.2145	2.189	31 26	34 29	1.2240	1.2984	0.6886
25.82	9.8702	0.9483	0.9271	1.2620	2.278	30 51	24 49	1.2384	1.3040	0.5643
Dec. 5.79	9.8882	0.9532	0.7307	1.2926	2.374	30 5	15 20	1.2530	1.3083	0.3679
15.77	+9.9065	+0.9552	+0.3276	+1.3083	+2.476	29 10	5 58	1.2673	1.3107	+9.9648
25.74	9.9244	0.9538	-0.0783	1.3102	2.580	28 6	356 39	1.2808	1.3110	-9.7155
35.71	+9.9413	+0.9491	-0.6519	+1.2984	+2.683	26 55	347 17	1.2932	1.3092	-0.2891

E = -0.001

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the stars, given on pages 316 to 513, from the mean places, given on pages 217 to 230. In order to render exact interpolation possible through intervals of ten days, all short-period terms have been omitted.

TERMS OF SHORT PERIOD IN NUTATION, 1923. 215

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
Jan. 0	-0.14	-0.06	Feb 15	+0.17	+0.04	Apr. 1	-0.11	+0.06	May 17	-0.11	-0.07
1	-0.07	0.07	16	0.11	0.06	2	0.14	+0.03	18	-0.05	0.07
2	+0.02	0.07	17	+0.04	0.06	3	0.14	-0.01	19	+0.02	0.06
3	0.09	0.05	18	-0.04	0.06	4	0.09	0.04	20	0.08	0.04
4	0.14	-0.02	19	0.11	0.05	5	-0.01	0.07	21	0.11	-0.01
5	+0.15	+0.02	20	-0.17	+0.03	6	+0.09	-0.07	22	+0.10	+0.03
6	0.11	0.05	21	0.20	+0.01	7	0.17	0.06	23	+0.05	0.06
7	+0.04	0.07	22	0.21	-0.02	8	0.23	0.04	24	-0.02	0.08
8	-0.04	0.07	23	0.19	0.05	9	0.25	-0.01	25	0.10	0.07
9	0.11	0.06	24	0.14	0.07	10	0.23	+0.02	26	0.16	0.05
10	-0.15	+0.03	25	-0.06	-0.07	11	+0.18	+0.05	27	-0.18	+0.02
11	0.15	-0.01	26	+0.02	0.06	12	0.11	0.06	28	0.16	-0.02
12	0.11	0.05	27	0.09	0.04	13	+0.03	0.06	29	0.10	0.05
13	-0.03	0.07	28	0.13	-0.01	14	-0.05	0.06	30	-0.01	0.07
14	+0.06	0.07	Mar. 1	0.13	+0.03	15	0.12	0.04	31	+0.09	0.07
15	+0.14	-0.06	2	+0.09	+0.06	16	-0.17	+0.02	June 1	+0.18	-0.06
16	0.19	0.04	3	+0.02	0.08	17	0.19	0.00	2	0.23	-0.03
17	0.21	-0.01	4	-0.05	0.07	18	0.19	-0.03	3	0.24	0.00
18	0.20	+0.02	5	0.11	0.05	19	0.16	0.05	4	0.22	+0.03
19	0.16	0.04	6	0.14	+0.02	20	0.11	0.07	5	0.16	0.05
20	+0.09	+0.06	7	-0.12	-0.02	21	-0.04	-0.07	6	+0.09	+0.06
21	+0.01	0.06	8	-0.06	0.05	22	+0.03	0.06	7	+0.01	0.06
22	-0.06	0.06	9	+0.02	0.07	23	0.08	-0.03	8	-0.06	0.05
23	0.13	0.05	10	0.11	0.07	24	0.10	+0.01	9	0.12	0.04
24	0.18	+0.02	11	0.18	0.06	25	0.09	0.04	10	0.16	+0.01
25	-0.21	0.00	12	+0.22	-0.03	26	+0.03	+0.07	11	-0.18	-0.01
26	0.20	-0.03	13	0.23	0.00	27	-0.04	0.08	12	0.16	0.04
27	0.17	0.05	14	0.20	+0.03	28	0.11	0.07	13	0.12	0.06
28	0.10	0.07	15	0.14	0.05	29	0.16	+0.04	14	-0.06	0.07
29	-0.02	0.07	16	+0.07	0.06	30	0.16	0.00	15	+0.01	0.07
30	+0.06	-0.06	17	-0.01	+0.06	May 1	-0.12	-0.03	16	+0.08	-0.05
31	0.12	-0.03	18	0.08	0.06	2	-0.05	0.06	17	0.12	-0.02
Feb. 1	0.15	+0.01	19	0.15	0.04	3	+0.05	0.07	18	0.12	+0.02
2	0.13	0.04	20	0.19	+0.01	4	0.14	0.07	19	0.09	0.05
3	+0.08	0.07	21	0.21	-0.01	5	0.21	0.05	20	+0.02	0.07
4	0.00	+0.08	22	-0.19	-0.04	6	+0.25	-0.02	21	-0.06	+0.08
5	-0.08	0.07	23	0.16	0.06	7	0.24	+0.01	22	0.13	0.06
6	0.13	+0.04	24	0.09	0.07	8	0.20	0.04	23	0.17	+0.03
7	0.14	0.00	25	-0.02	0.07	9	0.14	0.06	24	0.17	-0.01
8	0.11	-0.03	26	+0.05	0.05	10	+0.06	0.06	25	0.13	0.04
9	-0.05	-0.06	27	+0.10	-0.02	11	-0.02	+0.06	26	-0.05	-0.07
10	+0.04	0.07	28	0.11	+0.02	12	0.09	0.05	27	+0.04	0.07
11	0.12	0.07	29	0.09	0.05	13	0.14	+0.03	28	0.14	0.06
12	0.18	0.05	30	+0.03	0.07	14	0.18	0.00	29	0.20	0.04
13	0.22	-0.02	31	-0.05	0.08	15	0.19	-0.02	30	0.23	-0.01
14	+0.21	+0.01	Apr. 1	-0.11	+0.06	16	-0.16	-0.05	July 1	+0.22	+0.02
15	+0.17	+0.04	2	-0.14	+0.03	17	-0.11	-0.07	2	+0.18	+0.05

216 TERMS OF SHORT PERIOD IN NUTATION, 1923.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	"	"		"	"		"	"		"	"
July 1	+0.22	+0.02	Aug 16	-0.13	+0.05	Oct. 1	-0.10	-0.07	Nov. 16	+0.18	+0.06
2	0.18	0.05	17	0.16	+0.02	2	-0.03	0.07	17	0.10	0.07
3	0.11	0.06	18	0.15	-0.02	3	+0.04	0.06	18	+0.02	0.07
4	+0.03	0.07	19	0.10	0.05	4	0.08	-0.03	19	-0.06	0.05
5	-0.04	0.06	20	-0.02	0.07	5	0.10	0.00	20	0.12	0.03
6	-0.11	+0.04	21	+0.08	-0.07	6	+0.09	+0.04	21	-0.15	+0.01
7	0.15	+0.02	22	0.16	0.06	7	+0.04	0.07	22	0.16	-0.02
8	0.18	-0.01	23	0.21	-0.03	8	-0.03	0.08	23	0.15	0.04
9	0.17	0.03	24	0.23	0.00	9	0.10	0.07	24	0.11	0.06
10	0.14	0.05	25	0.20	+0.03	10	0.16	0.05	25	-0.05	0.07
11	-0.08	-0.07	26	+0.15	+0.05	11	-0.17	+0.01	26	+0.01	-0.07
12	-0.01	0.07	27	+0.07	0.07	12	0.14	-0.03	27	0.07	0.05
13	+0.06	0.06	28	-0.01	0.06	13	-0.06	0.06	28	0.10	-0.02
14	0.12	-0.03	29	0.08	0.05	14	+0.03	0.07	29	0.10	+0.02
15	0.14	0.00	30	0.13	0.04	15	0.13	0.07	30	+0.07	0.05
16	+0.12	+0.04	31	-0.17	+0.01	16	+0.21	-0.05	Dec. 1	0.00	+0.07
17	+0.06	0.07	Sept. 1	0.19	-0.02	17	0.25	-0.02	2	-0.08	0.08
18	-0.02	0.08	2	0.17	0.04	18	0.25	+0.01	3	0.16	0.07
19	0.10	0.07	3	0.13	0.06	19	0.21	0.04	4	0.20	+0.04
20	0.16	0.04	4	-0.07	0.07	20	0.14	0.06	5	0.20	0.00
21	-0.18	+0.01	5	0.00	-0.07	21	+0.06	+0.07	6	-0.16	-0.04
22	0.15	-0.03	6	+0.06	0.05	22	-0.02	0.06	7	-0.07	0.07
23	-0.09	0.06	7	0.11	-0.02	23	0.09	0.05	8	+0.04	0.08
24	+0.01	0.07	8	0.12	+0.02	24	0.14	+0.03	9	0.14	0.07
25	0.10	0.07	9	0.09	0.05	25	0.17	0.00	10	0.22	0.04
26	+0.18	-0.05	10	+0.03	+0.07	26	-0.17	-0.03	11	+0.25	-0.01
27	0.22	-0.02	11	-0.04	0.08	27	0.15	0.05	12	0.24	+0.02
28	0.22	+0.01	12	0.11	0.06	28	0.11	0.07	13	0.20	0.05
29	0.19	0.04	13	0.15	+0.03	29	-0.05	0.07	14	0.13	0.06
30	0.13	0.06	14	0.16	0.00	30	+0.02	0.06	15	+0.05	0.07
31	+0.05	+0.07	15	-0.11	-0.04	31	+0.07	-0.04	16	-0.03	+0.06
Aug. 1	-0.02	0.06	16	-0.03	0.07	Nov. 1	0.10	-0.01	17	0.09	0.04
2	0.09	0.05	17	+0.06	0.08	2	0.09	+0.03	18	0.13	+0.02
3	0.15	+0.03	18	0.15	0.07	3	+0.05	0.06	19	0.15	-0.01
4	0.18	0.00	19	0.21	0.04	4	-0.02	0.08	20	0.14	0.04
5	-0.18	-0.02	20	+0.24	-0.01	5	-0.10	+0.08	21	-0.11	-0.06
6	0.16	0.05	21	0.22	+0.02	6	0.16	0.06	22	-0.06	0.07
7	0.11	0.07	22	0.17	0.05	7	0.19	+0.02	23	0.00	0.07
8	-0.04	0.07	23	0.10	0.06	8	0.17	-0.02	24	+0.06	0.06
9	+0.03	0.06	24	+0.02	0.07	9	0.11	0.05	25	0.10	-0.03
10	+0.10	-0.04	25	-0.05	+0.06	10	-0.01	-0.07	26	+0.12	0.00
11	0.13	-0.01	26	0.12	0.04	11	+0.09	0.07	27	0.10	+0.04
12	0.13	+0.03	27	0.16	+0.02	12	0.18	0.06	28	+0.04	0.07
13	0.09	0.06	28	0.18	-0.01	13	0.24	-0.03	29	-0.05	0.08
14	+0.02	0.08	29	0.18	0.03	14	0.26	0.00	30	0.13	0.07
15	-0.06	+0.07	30	-0.15	-0.06	15	+0.23	+0.03	31	-0.19	+0.05
16	-0.13	+0.05	Oct. 1	-0.10	-0.07	16	+0.18	+0.06	32	-0.22	+0.01

MEAN PLACES OF TEN-DAY STARS, 1923. 217

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.			Annual Variation.		Annual P. M.			Declination.			Annual Variation.		Annual P. M.	
			h	m	s	s	s	°	'	"	°	'	"	"	"	"	"
33 Piscium	4.7	K0	0	1	23.683	+3.0713	-.0006	-	6	8	17.95	+20.135	+0.091				
α Andromedæ (<i>Alpheratz</i>)	2.2	A0p	0	4	24.224	3.0975	+.0107	+28	39	55.26	19.879	-0.163					
β Cassiopeia	2.4	F5	0	5	3.554	3.1894	+.0681	+58	43	30.44	19.860	-0.180					
ε Phœnicis	3.9	K0	0	5	30.388	3.0490	+.0096	-46	10	20.64	19.846	-0.193					
22 Andromedæ	5.1	F0	0	6	18.788	3.1125	+.0021	+45	38	37.65	20.033	-0.004					
γ Pegasi	2.9	B2	0	9	16.115	+3.0873	+.0003	+14	45	19.97	+20.019	-0.010					
σ Andromedæ	4.5	A2	0	14	18.024	3.1297	-.0044	+36	21	30.09	19.959	-0.047					
ι Ceti	3.8	K0	0	15	30.299	3.0568	-.0013	-	9	15	2.35	19.970	-0.030				
ζ Tucanæ	4.3	F8	0	16	4.849	3.1424	+.2735	-65	19	36.93	21.168	+1.172					
44 Piscium	6.0	G5	0	21	27.283	3.0747	-.0014	+	1	30	47.80	19.934	-0.023				
β Hydri	2.9	G0	0	21	43.780	+3.1885	+.6954	-77	41	16.44	+20.273	+0.318					
α Phœnicis	2.4	K0	0	22	28.945	2.9707	+.0188	-42	43	26.92	19.545	-0.403					
12 Ceti	6.0	K5	0	26	6.569	3.0622	+.0011	-	4	22	57.15	19.915	0.000				
13 Ceti	5.2	G0	0	31	17.039	3.0873	+.0273	-	4	0	59.28	19.841	-0.017				
ζ Cassiopeia	3.7	B2	0	32	40.378	3.3328	+.0036	+53	28	24.09	19.834	-0.007					
π Andromedæ	4.4	B3	0	32	45.813	+3.1997	+.0019	+33	17	44.52	+19.841	0.000					
ε Andromedæ	4.5	G5	0	34	28.946	3.1661	-.0172	+28	53	37.94	19.565	-0.254					
δ Andromedæ	3.5	K0	0	35	12.368	3.2039	+.0110	+30	26	22.85	19.712	-0.097					
α Cassiopeia (<i>Schedr</i>)	var.	K0	0	36	7.611	3.3914	+.0063	+56	6	55.01	19.765	-0.032					
μ Phœnicis	4.6	K0	0	37	41.313	2.8376	-.0046	-46	30	28.71	19.743	-0.032					
β Ceti	2.2	K0	0	39	43.517	+3.0120	+.0160	-18	24	32.12	+19.786	+0.041					
ο Cassiopeia	4.7	B2	0	40	25.618	3.3348	+.0028	+47	51	47.67	19.728	-0.006					
21 Cassiopeia	5.6	A2	0	40	31.996	3.9194	-.0050	+74	34	2.90	19.706	-0.026					
ζ Andromedæ	4.3	K0	0	43	15.201	3.1762	-.0073	+23	50	54.82	19.611	-0.078					
η Cassiopeia	3.6	F8	0	44	25.892	3.6188	+.1433	+57	24	30.72	19.193	-0.477					
δ Piscium	4.6	K5	0	44	41.135	+3.1108	+.0055	+	7	9	58.72	+19.621	-0.044				
λ Hydri	5.0	K5	0	45	55.853	2.0981	+.0125	-75	20	31.71	19.643	-0.001					
20 Ceti	4.9	K0	0	49	4.262	3.0645	-.0005	-	1	33	42.94	19.584	-0.003				
γ Cassiopeia	2.2	B0p	0	52	2.841	3.6038	+.0036	+60	18	0.41	19.525	-0.005					
μ Andromedæ	3.9	A2	0	52	28.396	3.3236	+.0132	+38	4	55.13	19.552	+0.030					
α Sculptoris	4.4	B5	0	54	53.709	+2.8896	-.0018	-29	46	24.92	+19.460	-0.013					
ε Piscium	4.4	K0	0	58	56.700	3.1120	-.0051	+	7	28	33.23	19.111	+0.026				
β Phœnicis	3.4	K0	1	2	38.880	2.6781	-.0037	-47	7	52.37	19.276	-0.024					
μ Cassiopeia	5.3	G5	1	3	8.045	3.9752	+.3920	+54	32	36.16	17.732	-1.557					
η Ceti	3.6	K0	1	4	42.967	3.0175	+.0143	-10	35	23.88	19.125	-0.126					
β Andromedæ	2.4	Ma	1	5	24.876	+3.3531	+.0148	+35	12	45.58	+19.117	-0.117					
τ Piscium	4.7	K0	1	7	24.882	3.2992	+.0036	+29	40	52.51	19.155	-0.029					
ζ Piscium	5.6	A5	1	9	42.392	3.1326	+.0096	+	7	10	6.83	19.073	0.052				
κ Tucanæ	5.0	F8	1	13	9.541	2.0381	+.0713	-69	17	6.52	19.121	+0.089					
ψ Piscium	5.3	A2	1	13	49.546	3.0932	-.0033	+	3	12	33.61	18.988	-0.025				
ν Piscium	4.7	A2	1	15	13.771	+3.2926	+.0016	+26	51	35.19	+18.966	-0.008					
θ Ceti	3.8	K0	1	20	10.431	2.9979	-.0057	-	8	34	48.95	18.616	-0.215				
δ Cassiopeia	2.8	A5	1	20	45.872	3.9071	+.0107	+59	50	8.96	18.776	-0.037					
γ Phœnicis	3.4	K5	1	25	1.357	2.6067	-.0029	-43	42	45.47	18.456	-0.225					
38 Cassiopeia	6.0	F5	1	25	28.352	4.4274	+.0263	+69	52	8.55	18.595	-0.072					
η Piscium	3.7	G5	1	27	21.575	+3.2070	+.0015	+14	56	57.72	+18.603	-0.003					
ν Andromedæ	4.2	G0	1	32	16.218	3.5129	-.0153	+41	1	15.31	18.066	-0.377					
40 Cassiopeia	5.5	K0	1	32	19.765	4.7484	-.0011	+72	38	54.38	18.438	-0.002					
π Piscium	5.6	F0	1	33	0.814	3.1776	-.0049	+11	44	53.09	18.451	+0.034					
ν Persei	3.8	K0	1	33	15.376	3.6715	+.0064	+48	14	19.04	18.288	-0.119					
α Eridani (<i>Achernar</i>)	0.6	B5	1	34	50.866	+2.2351	+.0103	-57	37	39.77	+18.312	-0.041					
ω Cassiopeia	5.5	A0p	1	36	36.857	4.4118	+.0089	+67	39	15.59	18.288	-0.002					
ν Piscium	4.7	K0	1	37	25.338	3.1205	-.0015	+	5	5	54.57	18.264	+0.003				
φ Persei	4.2	B0p	1	38	49.446	3.7486	+.0031	+50	18	5.31	18.195	-0.015					
τ Ceti	3.6	K0	1	40	29.414	2.7867	-.1198	-16	20	32.75	19.008	+0.869					
ο Piscium	4.5	K0	1	41	19.510	+3.1659	+.0049	+	8	46	14.47	+18.162	+0.045				
ε Sculptoris	5.4	F0	1	42	2.117	+2.8043	+.0052	-25	26	12.56	+18.040	-0.051					

13 Ceti, dup., 5^m.5, 6^m.2, 0^h.3
α Cassiop., var. irreg., 2^m.2, 2^m.8
γ Cassiop., comp. 7^m.6, 4^h. n. pr.

β Phœnicis, dup., 4^m.1, 4^m.1, 1^h
ζ Piscium, star 6^m.5, 24^h. n. l.

κ Tucanæ, comp. 7^m. 6^h. n.
ε Sculptoris, comp. 9^m. 5^h. n. f.

218 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.			Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.	
			h	m	s	s	s	° ' "	"	"	
ζ Ceti	3.9	K0	1	47	39.545	+2.9603	+0.0020	-10 42 53.31	+17.847	-0.027	
α Trianguli	3.6	F5	1	48	41.233	3.4154	+0.0015	+29 12 15.77	17.602	-0.231	
ε Cassiopeiae	3.4	B3	1	48	50.224	4.2925	+0.0053	+63 17 30.13	17.812	-0.015	
ξ Piscium	4.8	K0	1	49	34.048	3.1044	+0.0015	+ 2 48 28.70	17.818	+0.021	
β Arietis	2.7	A5	1	50	22.913	3.3098	+0.0064	+20 25 56.01	17.654	-0.111	
ψ Phœnicis	4.4	Mb	1	50	33.420	+2.4030	-.0124	-46 40 46.91	+17.653	-0.104	
α Hydri	3.0	F0	1	56	20.135	1.8816	+0.0276	-61 56 39.10	17.544	+0.026	
ν Ceti	4.2	K5	1	56	22.572	2.8257	+0.0082	-21 27 1.05	17.507	-0.009	
50 Cassiopeiae	4.1	A0	1	56	49.450	5.0763	-.0092	+72 2 58.67	17.517	+0.020	
γ Andromedæ pr.	2.3	K0	1	59	9.903	3.6744	+0.0046	+41 57 39.58	17.345	-0.051	
γ Andromedæ seq.	5.1	A	Δα + 0.842			....	...	Δδ + 4.56	....	...
α Arietis	2.2	K2	2	2	49.691	+3.3777	+0.0139	+23 5 56.58	+17.090	-0.144	
β Trianguli	3.1	A5	2	4	57.344	3.5639	+0.0127	+34 37 25.60	17.094	-0.044	
55 Cassiopeiae	6.2	F5	2	8	24.999	4.6783	-.0020	+66 9 52.20	16.977	-0.002	
6 Persei	5.4	K0	2	8	28.414	3.9779	+0.0368	+50 42 32.18	16.810	-0.167	
ξ Ceti	4.5	G5	2	8	54.975	+3.1778	-.0012	+ 8 29 9.78	+16.940	-0.016	
μ Fornacis	5.2	A0	2	9	30.733	2.6376	-.0037	-31 5 5.56	16.906	-0.022	
γ Trianguli	4.1	A0	2	12	43.849	3.5607	+0.0010	+33 29 30.62	16.724	-0.052	
67 Ceti	5.7	G5	2	13	8.479	2.9910	+0.0054	- 6 46 35.11	16.646	-0.110	
φ Eridani	3.8	B8	2	13	45.401	2.1409	+0.0062	-51 52 5.66	16.698	-0.029	
ο Ceti (<i>Mira</i>)	†	var.	Md	2	15	27.327	+3.0296	+0.0002	- 3 19 35.28	+16.416	-0.229
κ Fornacis	5.4	F5	2	19	1.114	2.7447	+0.0138	-24 9 56.90	16.392	-0.077	
δ Hydri	4.3	A2	2	20	22.376	1.0606	-.0097	-69 0 33.94	16.421	+0.020	
ε Cassiopeiae	†	A5p	2	22	41.967	4.9136	-.0003	+67 3 26.34	16.294	+0.010	
ξ ² Ceti	4.3	A0	2	24	3.739	3.1874	+0.0025	+ 8 6 56.48	16.206	-0.007	
σ Ceti	4.8	F5	2	28	26.166	+2.8417	-.0063	-15 34 54.11	+15.883	-0.102	
36 H. Cassiopeiae	5.3	K0	2	30	40.520	5.6549	-.0052	+72 28 58.09	15.884	+0.017	
ν Ceti	5.0	G5	2	31	49.840	+3.1160	-.0025	+ 5 15 29.13	15.786	-0.018	
μ Hydri	5.3	K0	2	33	15.686	-1.3315	+0.0124	-79 26 43.99	15.689	-0.038	
ν Arietis	5.4	A2	2	34	26.426	+3.4036	+0.0001	+21 37 45.20	15.642	-0.021	
δ Ceti	4.0	B2	2	35	32.048	+3.0738	+0.0011	- 0 0 10.05	+15.608	+0.004	
ε Hydri	4.3	B9	2	38	23.955	0.9164	+0.0168	-68 35 48.03	15.450	+0.005	
θ Persei	4.2	G0	2	38	55.876	4.0874	+0.0353	+48 54 13.79	15.327	-0.088	
γ Ceti seq.	†	A0	2	39	18.515	3.1067	-.0096	+ 2 54 43.47	15.244	-0.150	
π Ceti	4.4	B5	2	40	27.392	2.8540	-.0012	-14 11 2.55	15.318	-0.011	
μ Ceti	4.4	A5	2	40	46.593	+3.2404	+0.0188	+ 9 47 23.86	+15.286	-0.025	
η Persei	†	K0	2	45	4.111	4.3630	+0.0011	+55 34 37.51	15.055	-0.012	
41 Arietis	3.7	B8	2	45	26.788	3.5266	+0.0050	+26 56 38.82	14.933	-0.111	
β Fornacis	4.5	K0	2	45	52.089	2.5121	+0.0080	-32 43 43.46	15.176	+0.156	
σ Arietis	5.5	B5	2	47	14.280	3.3092	+0.0016	+14 45 55.80	14.906	-0.034	
τ ² Eridani	4.8	K0	2	47	32.654	+2.7201	-.0044	-21 19 14.12	+14.906	-0.017	
τ Persei	4.1	G0p	2	48	47.247	4.2411	+0.0008	+52 26 54.59	14.847	-0.003	
η Eridani	4.0	K0	2	52	39.912	2.9306	+0.0060	- 9 12 13.60	14.407	-0.213	
ε Arietis (<i>mean</i>)	†	A2	2	54	48.293	3.4269	-.0009	+21 1 59.62	14.482	-0.010	
θ Eridani	†	A2	2	55	20.624	2.2767	-.0025	-40 36 45.40	14.483	+0.024	
47 H. Cephei	5.7	Ma	2	55	46.841	+7.8858	-.0102	+79 6 59.32	+14.443	+0.010	
α Ceti	2.8	Ma	2	58	15.125	3.1340	-.0009	+ 3 47 18.58	14.204	-0.078	
τ ³ Eridani	4.2	A3	2	58	59.814	2.6450	-.0104	-23 55 31.55	14.192	-0.044	
γ Persei	3.1	G0p	2	59	12.522	4.3328	+0.0010	+53 12 22.13	14.218	-0.004	
ρ Persei	†	var.	Mb	3	0	14.139	3.8379	+0.0116	+38 32 34.28	14.044	-0.115
μ Horologii	5.2	F0	3	1	47.627	+1.4086	-.0123	-60 2 8.80	+14.008	-0.054	
θ Hydri	5.5	B8	3	2	4.947	0.1058	+0.0034	-72 12 11.33	14.058	+0.014	
β Persei (<i>Algol</i>)	†	var.	B8	3	3	9.995	3.8963	+0.0008	+40 39 36.35	13.976	-0.002
δ Arietis	4.5	K0	3	7	13.351	3.4275	+0.0110	+19 26 11.58	13.721	+0.001	
12 Eridani	†	F8	3	8	47.936	2.5469	+0.0241	-29 17 23.87	14.256	+0.636	
ζ Arietis	5.0	A0	3	10	28.297	+3.4450	-.0019	+20 45 35.91	+13.430	-0.082	
48 H. Cephei	5.5	F0	3	10	29.472	+7.5292	+0.0204	+77 27 14.30	+13.455	-0.055	

ο Ceti, var., 331^d, 1^m.7-9^m.6, star 9^m.f. 8^m
 ι Cassiop., triple, 7^m, 8^m, 2", 8"
 γ Ceti, comp. 6^m.2, 2".7 pr.

η Persei, star 8^m.5, 28" n. pr.
 ε Arietis, dup., 5^m.2, 5^m.6, 1".2
 θ Eridani, comp. 4^m.4, f. 8"

ρ Persei, var. irreg., 3^m.4-4^m.2
 β Persei, var., 21.87, 2^m.1-3^m.2
 12 Eridani, comp. 7^m, 1".4 n. pr.

MEAN PLACES OF TEN-DAY STARS, 1923. 219

FOR JANUARY C^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			h m s	s	s	° ' "	"	"
38 G. Horologii	† 5.7	N	3 10 35.884	+1.5155	-.0005	-57 36 34.59	+13.497	-0.006
ζ Eridani	4.9	A3	3 12 5.504	2.9128	-.0008	- 9 6 17.31	13.460	+0.053
τ Arietis	5.2	B3	3 16 46.690	3.4607	+0.0023	+20 52 13.46	13.066	-0.033
ε Eridani	4.3	G5	3 16 51.144	+2.3979	+2.808	-43 21 48.45	13.850	+0.755
ι Hydri	5.5	F2	3 17 50.771	-1.5384	+0.0351	-77 40 13.29	13.068	+0.010
α Persei	1.9	F5	3 18 48.964	+4.2729	+0.0030	+49 35 18.15	+12.936	-0.028
ο Tauri	3.8	G5	3 20 40.019	3.2263	-.0046	+ 8 45 31.99	12.766	-0.074
2 H. Camelopardalis	4.4	A0	3 22 49.285	4.8434	+0.0027	+59 40 24.41	12.696	+0.001
ξ Tauri	3.8	B8	3 22 59.622	3.2493	+0.0040	+ 9 27 54.18	12.636	-0.046
f Tauri	4.3	K0	3 26 37.162	3.3100	+0.0016	+12 40 25.80	12.438	+0.002
ε Eridani	† 3.8	K0p	3 29 18.094	+2.8257	-.0660	- 9 43 4.48	+12.278	+0.027
γ Eridani	4.3	B8	3 30 23.093	2.6185	+0.0023	-21 53 25.56	12.137	-0.039
δ Persei	3.1	B5	3 37 26.077	4.2633	+0.0035	+47 32 33.63	11.644	-0.036
δ Eridani	3.7	K0	3 39 33.534	2.8735	-.0061	-10 1 23.94	12.260	+0.731
ν Persei	3.9	F5	3 39 57.388	4.0695	-.0004	+42 20 12.03	11.500	0.000
5 H. Camelopardalis	4.7	A0	3 42 12.213	+6.2967	+0.0059	+71 5 48.37	+11.282	-0.057
η Tauri (<i>Alcyone</i>)	† 3.0	B5	3 42 54.217	3.5630	+0.0016	+23 52 5.22	11.239	-0.050
γ Eridani	4.3	F8	3 43 32.079	2.5808	-.0115	-23 28 32.07	10.761	-0.481
g Eridani	4.2	K0	3 46 34.395	+2.2453	-.0036	-36 25 56.87	10.994	-0.028
γ Hydri	3.2	Ma	3 48 24.754	-0.9568	+0.0067	-74 28 30.94	11.004	+0.117
ζ Persei	2.9	B1	3 49 17.236	+3.7673	+0.0010	+31 39 22.17	+10.808	-0.014
9 H. Camelopardalis	† 5.2	K0p	3 50 33.520	5.0998	+0.0003	+60 53 5.52	10.712	-0.017
ε Persei	† 3.0	B0	3 52 40.909	4.0215	+0.0031	+39 47 19.58	10.544	-0.027
ξ Persei	4.0	Oe5	3 53 57.858	3.8888	+0.0012	+35 34 14.50	10.459	-0.017
γ Eridani	3.2	K5	3 54 26.182	2.7988	+0.0017	-13 43 35.88	10.330	-0.111
λ Tauri	† var.	B3	3 56 24.735	+3.3221	+0.0002	+12 16 25.95	+10.282	-0.011
δ Reticuli	4.4	Ma	3 57 31.219	0.9424	-.0020	-61 37 1.11	10.207	-0.002
ν Tauri	3.9	A0	3 59 3.521	3.1904	+0.0008	+ 5 46 36.11	10.068	-0.005
Δ Tauri	† 4.5	K0	4 0 8.403	3.5415	+0.0069	+21 52 21.76	9.954	-0.058
c Persei	4.0	B3p	4 3 3.938	4.3500	+0.0042	+47 30 30.03	9.757	-0.032
p Tauri	5.6	F0	4 6 8.278	+3.6505	-.0024	+26 16 52.23	+ 9.512	-0.042
ο Eridani	4.1	F5	4 8 6.354	2.9278	+0.0007	- 7 2 14.26	9.488	+0.086
μ Tauri	4.3	B3	4 11 21.080	3.2564	+0.0016	+ 8 42 2.23	9.126	-0.024
α Horologii	3.8	K0	4 11 26.997	1.9877	+0.0040	-42 29 2.18	8.912	-0.231
α Reticuli	3.4	G5	4 13 25.667	0.7667	+0.0018	-62 39 58.79	9.033	+0.044
γ Tauri	3.9	K0	4 15 24.550	+3.4125	+0.0083	+15 26 34.24	+ 8.807	-0.026
δ Tauri	3.9	K0	4 18 29.500	3.4578	+0.0075	+17 21 47.15	8.560	-0.030
ν Eridani	4.1	K5	4 21 8.657	+2.2531	+0.0032	-34 11 41.98	8.423	+0.042
δ Mensæ	5.6	K0	4 23 8.180	-4.1252	+0.0043	-80 23 44.14	8.294	+0.072
ε Tauri	3.6	K0	4 24 7.094	+3.5016	+0.0082	+19 0 39.17	8.109	-0.034
m Persei	† 6.1	F0	4 27 59.554	+4.2171	+0.0012	+42 54 3.12	+ 7.837	+0.004
α Tauri (<i>Aldebaran</i>)	1.1	K5	4 31 30.001	3.4408	+0.0047	+16 21 20.55	7.360	-0.189
α Doradus	3.5	A0p	4 32 19.880	1.2954	+0.0067	-55 12 14.01	7.471	-0.011
ν Eridani	4.1	B2	4 32 28.208	2.9962	-.0005	- 3 30 31.52	7.471	0.000
53 Eridani	4.0	K0	4 34 39.121	2.7458	-.0061	-14 27 12.51	7.139	-0.154
τ Tauri	4.3	B5	4 37 37.287	+3.5996	+0.0007	+22 48 37.62	+ 7.031	-0.020
α Coeli	4.5	F2	4 38 4.706	1.9303	-.0149	-42 0 37.80	6.907	-0.106
Groombridge 848	6.0	F0	4 38 26.534	8.0338	+0.0094	+75 48 13.40	6.840	-0.144
4 Camelopardalis	5.4	A2	4 41 34.941	4.9897	+0.0062	+56 37 19.92	6.577	-0.148
μ Eridani	4.2	B5	4 41 39.086	2.9992	+0.0011	- 3 23 40.76	6.711	-0.009
π Orionis	3.3	F8	4 45 39.515	+3.2557	+0.0012	+ 6 49 41.30	+ 6.412	+0.023
9 Camelopardalis	4.4	B0	4 46 23.146	5.9535	+0.0039	+66 12 50.42	6.333	+0.005
ι Tauri	5.1	F0	4 46 52.059	3.5084	+0.0059	+18 42 36.22	6.253	-0.035
π Orionis	3.9	B3	4 50 14.374	3.1245	+0.0002	+ 2 18 56.96	6.013	+0.005
τ Aurigæ	2.9	K2	4 51 58.583	3.9050	+0.0009	+33 2 44.04	5.841	-0.021
ε Aurigæ	† var.	F5p	4 56 26.433	+4.3027	+0.0012	+43 42 39.07	+ 5.475	-0.013
β Camelopardalis	4.2	G0	4 56 33.642	+5.3289	-.0004	+60 19 54.02	+ 5.467	-0.011

38 Horologii, remarkable purplish red star.
 ε Eridani, comp. 9^m, s. 7"

η Tauri, quad., comps. 6^m.3, 7^m.6, 8^m.2, 11^m.7, 181^m.1, 190^m.7
 9 H. Camelop., comp. 8^m, 1^m.9 n. f.
 ε Persei, comp. 8^m, 8^m.6 n. f.

λ Tauri, var., 34.95, 3^m.3-4^m.2
 Δ Tauri, star 8^m.5 f. 33^m.254^m s.
 m Persei, star 7^m, 115^m.5 s. pr.
 ε Aurigæ, var. irreg., 3^m.0-4^m.5

220 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.			Annual Vari- ation.	Annual P. M.
			h	m	s			°	'	"		
ζ Aurigæ	3.9	K0p	4	57	5.544	+4.1909	+0.013	+40	57	54.01	+5.411	-0.022
ι Tauri	4.7	A5	4	58	29.517	3.5854	+0.0056	+21	28	52.12	5.266	-0.049
11 Orionis	4.6	B9	5	0	10.065	3.4272	+0.0013	+15	17	53.22	5.138	-0.036
η Aurigæ	3.3	B3	5	1	6.755	4.2054	+0.0039	+41	7	54.56	5.022	-0.072
ε Leporis	3.3	K5	5	2	12.043	2.5387	+0.0012	-22	28	24.54	4.938	-0.064
β Eridani	2.9	A2	5	4	3.844	+2.9495	-0.0058	-5	11	5.33	+4.770	-0.074
μ Aurigæ	4.8	A3	5	8	9.355	4.1027	-0.0020	+38	23	41.11	4.416	-0.080
μ Leporis	3.3	A0p	5	9	28.326	2.6942	+0.0027	-16	17	44.26	4.356	-0.028
19 H. Camelopardalis .	5.2	F8	5	9	50.252	9.8489	-0.0274	+79	8	46.52	4.508	+0.156
β Orionis (<i>Rigel</i>) . . .	0.3	B8p	5	10	50.186	2.8826	.0000	-8	17	22.17	4.267	0.000
α Aurigæ (<i>Capella</i>) . .	0.2	G0	5	10	59.883	+4.4299	+0.0086	+45	55	16.73	+3.824	-0.429
λ Aurigæ	4.8	G0	5	13	43.330	4.2186	+0.0460	+40	1	55.89	3.360	-0.660
τ Orionis	3.7	B5	5	13	52.027	2.9128	-0.0009	-6	55	35.38	4.003	-0.005
ο Columbae	4.9	K0	5	14	42.246	2.1590	+0.0027	-34	58	11.79	3.584	-0.352
γ Orionis (<i>Bellatrix</i>) .	1.7	B2	5	21	0.014	3.2173	-0.0004	+6	16	51.92	3.377	-0.017
β Tauri	1.8	B8	5	21	25.385	+3.7919	+0.0025	+28	32	37.71	+3.181	-0.177
17 Camelopardalis . . .	5.8	K5	5	22	53.610	5.6620	+0.0003	+63	0	17.70	3.224	-0.007
β Leporis	3.0	G0	5	24	56.762	2.5705	.0000	-20	49	11.33	2.965	-0.089
χ Aurigæ	4.9	B1	5	27	42.897	3.9045	+0.0006	+32	8	11.23	2.801	-0.013
δ Orionis	2.5	B0	5	28	4.324	3.0615	.0000	-0	21	17.92	2.781	-0.002
α Leporis	2.7	F0	5	29	20.031	+2.6459	+0.0003	-17	52	35.14	+2.674	0.000
Groombridge 966 . . .	6.4	K5	5	29	25.137	8.0110	-0.0002	+74	59	44.74	2.684	+0.017
φ ¹ Orionis	4.5	B0	5	30	35.535	3.2929	-0.0002	+9	26	18.72	2.550	0.015
ι Orionis	2.9	Oe5	5	31	39.965	2.9345	+0.0001	-5	57	33.77	2.470	-0.002
ε Orionis	1.8	B0	5	32	18.338	3.0438	.0000	-1	14	59.62	2.417	+0.001
ζ Tauri	3.0	B3	5	33	2.531	+3.5853	+0.0006	+21	5	48.42	+2.320	-0.032
α Columbae	2.8	B5p	5	36	51.645	2.1727	+0.0006	-34	6	52.05	1.982	-0.038
ι Orionis	2.0	B0	5	36	52.390	3.0272	+0.0005	-1	58	56.36	2.005	-0.014
ο Aurigæ	5.5	A0	5	39	55.981	4.6159	-0.0018	+49	47	38.93	1.734	0.018
ζ Leporis	3.7	A2	5	43	27.952	2.7181	-0.0013	-14	50	58.58	1.444	-0.001
κ Orionis	2.2	B0	5	44	6.256	+2.8451	+0.0001	-9	41	45.27	+1.386	-0.003
δ Doradus	4.5	A5	5	44	37.928	0.1028	-0.0081	-65	45	51.95	1.342	-0.001
ν Aurigæ	4.2	K0	5	46	9.144	4.1577	-0.0001	+39	7	39.13	1.224	+0.013
δ Leporis	3.9	K0	5	48	0.562	2.5797	+0.0161	-20	53	4.65	0.399	-0.649
α Orionis (<i>Betelgeuse</i>) .	var.	Ma	5	51	0.071	3.2480	+0.0020	+7	23	38.18	0.796	+0.009
η Leporis	3.8	F5	5	52	53.855	+2.7325	-0.0028	-14	10	50.62	+0.762	+0.141
δ Aurigæ	3.9	K0	5	53	11.289	4.9421	+0.0118	+54	16	50.66	0.477	-0.118
β Aurigæ	2.1	A0p	5	53	52.876	4.4021	-0.0038	+44	56	28.51	0.529	-0.006
θ Aurigæ	2.7	A0p	5	54	28.235	4.0918	+0.0047	+37	12	31.02	+0.393	-0.091
1 Geminorum	4.3	G5	5	59	26.391	3.6476	+0.0002	+23	16	7.57	-0.060	-0.109
1 G. Puppis	6.2	F8	6	2	15.438	+1.7260	-0.0088	-45	2	9.59	+0.028	+0.225
ν Orionis	4.4	B2	6	3	10.569	3.4265	+0.0012	+14	46	44.07	-0.303	-0.025
η Geminorum	var.	Ma	6	10	13.835	3.6227	-0.0039	+22	31	49.55	0.911	-0.016
22 H. Camelopardalis .	4.7	A0	6	10	21.932	6.6174	+0.0025	+69	20	57.52	1.020	-0.114
2 Lyncis	4.4	A0	6	12	49.993	5.2981	+0.0012	+59	2	27.10	1.092	+0.030
ζ Canis Majoris	3.1	B3	6	17	21.341	+2.3020	-0.0006	-30	1	43.21	-1.540	-0.023
μ Geminorum	3.2	Ma	6	18	18.170	3.6806	+0.0046	+22	33	16.11	1.714	-0.114
ψ ¹ Aurigæ	5.1	K2	6	18	58.292	4.6255	+0.0029	+49	19	44.18	1.661	-0.004
β Canis Majoris	2.0	B1	6	19	18.505	2.6417	-0.0006	-17	54	59.71	1.683	+0.004
8 Monocerotis	4.5	A5	6	19	41.306	3.1802	-0.0004	+4	37	59.36	1.711	+0.009
α Argus (<i>Canopus</i>) . . .	-0.9	F0	6	22	14.557	+1.3320	+0.0022	-52	39	11.61	-1.934	+0.009
10 Monocerotis	5.0	B3	6	24	9.503	2.9642	+0.0010	-4	42	48.07	2.103	+0.006
ν Geminorum	4.1	B5	6	24	23.482	3.5628	-0.0005	+20	15	43.98	2.145	-0.016
8 Lyncis	6.0	G0	6	30	39.551	5.4904	-0.0267	+61	33	3.29	2.949	-0.276
ξ ² Canis Majoris	4.5	A0	6	31	49.780	2.5158	+0.0022	-22	54	8.23	2.740	+0.035
23 H. Camelopardalis .	5.6	F8	6	33	7.316	+10.2861	-0.0286	+79	39	5.07	-3.520	-0.632
γ Geminorum	1.9	A0	6	33	15.865	+3.4669	+0.0033	+16	27	58.47	-2.947	-0.048

β Orionis, comp. 8^m.0, 9^m.5 s. pr.
 δ Orionis, star 6^m.9, 52^m.6 n.
 ε Orionis, comp. 7^m.3, 11^m.5 s. f.

ζ Orionis, comp. 4^m.2, 2^m.4 s. f.
 α Orionis, red star, var. irreg., 1^m.0-
 1^m.4
 θ Aurigæ, comp. 7^m.5, 2^m.5 n. pr.

1 Puppis, star 5^m.8, f. 12^m, 150^m s.
 γ Gem. var., 23^d.4, 3^m.2-4^m.2, comp.
 8^m.8, 1^m.2 n. pr.
 8 Monoc., star 6^m.5, 13^m.7 n. f.

MEAN PLACES OF TEN-DAY STARS, 1923. 221

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spect- rum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
51 Aurigæ	5.7	K0	6 33 19.491	+4.1592	-.0020	+39 27 36.80	- 3.017	-0.113
ν Argus	3.2	B8	6 35 24.403	1.8368	+0.0008	-43 7 40.15	3.104	-0.019
8 Monocerotis	4.7	Oe5	6 36 44.273	3.3046	.0000	+ 9 58 5.35	3.207	-0.008
ε Geminorum	3.2	G5	6 39 11.746	3.6925	-.0001	+25 12 31.47	3.430	-0.018
ξ Geminorum	3.4	F5	6 40 58.106	3.3682	-.0076	+12 58 47.58	3.757	-0.193
ψ ⁸ Aurigæ	5.3	G0	6 41 11.597	+4.3291	+0.0018	+43 39 20.27	- 3.424	+0.160
α Canis Majoris (<i>Sirius</i>) †	-1.6	A0	6 41 45.294	2.6434	-.0374	-16 36 34.35	4.838	-1.206
18 Monocerotis	4.7	K0	6 43 50.731	3.1280	-.0020	+ 2 29 51.32	3.827	-0.016
43 Camelopardalis	5.1	B5	6 45 24.765	6.4844	+0.0021	+68 58 48.78	3.934	+0.012
α Pictoris	3.3	A5	6 47 24.180	0.6172	-.0104	-61 51 31.16	3.878	+0.238
θ Geminorum	3.6	A2	6 47 42.992	+3.9575	+0.0010	+34 3 19.96	- 4.194	-0.050
τ Argus	2.8	K0	6 48 1.514	1.4883	+0.0024	-50 31 21.94	4.277	-0.107
θ Canis Majoris	4.2	K2	6 50 36.775	2.7880	-.0091	-11 56 27.56	4.398	-0.007
15 Lyncis	4.5	K0	6 50 37.037	5.2047	+0.0021	+58 31 32.15	4.521	-0.130
ε Canis Majoris	1.6	B1	6 55 35.962	2.3575	-.0001	-28 51 58.91	4.813	+0.003
ζ Geminorum	var.	G0	6 59 32.610	+3.5602	-.0002	+20 41 4.20	- 5.156	-0.007
σ ² Canis Majoris	3.1	B5p	6 59 48.550	2 5049	-.0006	-23 43 11.23	5.167	+0.005
γ Canis Majoris	4.1	B5	7 0 16.508	2.7118	+0.0003	-15 31 6.54	5.221	-0.010
δ Canis Majoris	2.0	F8	7 5 15.560	2.4382	-.0015	-26 16 12.08	5.628	+0.003
63 Aurigæ	5.1	K2	7 6 21.783	4.1318	+0.0052	+39 26 51.44	5.726	-0.003
51 Geminorum	5.3	Mb	7 8 57.104	+3.4476	+0.0019	+16 17 27.18	- 5.982	-0.042
γ ² Volantis	3.9	K0	7 9 24.263	-0.5038	+0.0004	-70 22 27.11	5.900	+0.078
λ Geminorum	3.6	A2	7 13 40.171	+3.1498	-.0029	+16 40 49.62	6.378	-0.045
π Argus	2.7	K5	7 14 25.394	2.1190	.0008	-36 57 31.33	6.405	-0.010
δ Geminorum	3.5	F0	7 15 31.602	+3.5859	-.0010	+22 7 31.43	6.501	-0.015
δ Volantis	4.0	F5	7 16 52.835	-0.0214	+0.0004	-67 48 58.97	- 6.605	-0.006
ι Geminorum	3.9	K0	7 20 56.818	+3.7296	-.0086	+27 57 8.77	7.021	-0.087
η Canis Majoris	2.4	B5p	7 21 3.013	2.3738	+0.0003	-29 9 7.16	6.935	+0.007
Groombridge 1308	5.8	K0	7 22 53.135	6.2680	+0.0018	+68 37 30.22	7.137	-0.045
β Canis Minoris	3.1	B8	7 22 58.581	3.2551	-.0032	+ 8 26 44.12	7.147	-0.047
ρ Geminorum	4.2	F0	7 24 9.690	+3.8621	+0.0118	+31 56 20.95	- 7.014	+0.183
σ Argus	3.3	K5	7 26 47.211	1.9019	-.0071	-43 8 41.42	7.230	+0.180
α ² Geminorum (<i>Castor</i>)	2.0	A0	7 29 41.397	3.8321	-.0144	+32 3 32.79	7.727	-0.082
α ¹ Geminorum	2.8	A0	Δα - 0.225	....	....	Δδ - 4.09	....	....
25 Monocerotis	5.2	F5	7 33 26.954	2.9817	-.0066	- 3 56 16.45	7.927	+0.022
α Can. Min. (<i>Procyon</i>)	0.5	F5	7 35 16.327	+3.1417	-.0472	+ 5 25 23.65	- 9.131	-1.036
24 Lyncis	5.0	A2	7 36 30.125	5.0897	-.0043	+58 53 32.11	8.249	-0.056
κ Geminorum	3.7	G5	7 39 48.131	3.6256	-.0014	+24 35 1.69	8.516	-0.060
β Geminorum (<i>Pollux</i>)	1.2	K0	7 40 36.420	3.6717	-.0470	+28 12 48.27	8.574	-0.054
4 Puppis	5.1	F2	7 42 24.144	2.7636	-.0003	-14 22 32.51	8.664	-0.002
ξ Argus	3.5	G0	7 46 3.351	+2.5233	-.0004	-24 39 56.20	- 8.948	0.000
φ Geminorum	5.0	A2	7 48 47.291	3.6755	-.0020	+26 57 59.10	9.188	-0.027
26 Lyncis	5.7	K0	7 49 6.812	4.3788	-.0022	+47 45 56.33	9.192	-0.005
Groombridge 1374	5.6	K0	7 51 0.698	7.2291	-.0023	+74 7 33.44	9.371	-0.037
χ Argus	3.6	B3	7 54 49.298	1.5256	-.0043	-52 46 31.62	9.622	+0.006
ω Cancri	5.9	K0	7 56 16.474	+3.6328	+0.0003	+25 36 17.07	- 9.743	-0.004
χ Geminorum	5.0	K0	7 58 47.576	3.6891	-.0012	+28 0 40.80	9.983	-0.053
27 Lyncis	4.9	A2	8 2 40.564	4.5266	-.0032	+51 43 48.54	10.227	-0.003
ρ Argus	2.9	F5	8 4 15.865	2.5547	-.0065	-24 4 52.88	10.291	+0.052
3 H. Ursæ Majoris	5.5	G5	8 5 10.278	6.0023	+0.0002	+68 42 9.56	10.407	+0.005
γ Argus	2.2	Oap	8 7 9.645	+1.8498	-.0003	-47 6 33.15	-10.571	-0.011
ζ Cancri (<i>mean</i>)	4.7	G0	8 7 47.905	3.4437	+0.0051	+17 52 52.41	10.736	-0.129
20 Puppis	5.0	G5	8 9 47.619	2.7579	-.0009	-15 33 19.05	10.754	+0.001
Bradley 1147	5.7	G5	8 9 54.725	7.5999	+0.0077	+75 59 38.70	10.771	-0.008
β Cancri	3.8	K2	8 12 20.447	3.2551	-.0035	+ 9 25 26.04	10.994	-0.052
31 Lyncis	4.4	K5	8 17 34.371	+4.1183	+0.0015	+43 26 11.25	-11.422	-0.100
δ ¹ Cancri	5.9	F0	8 18 57.447	+3.4381	-.0038	+18 34 49.66	-11.453	-0.034

8 Monoc., comp. 8^m.3, 2^s.9 s. pr. γ² Volantis, comp. 5^m.8, 12^s.9 n. pr. γ Argus, star 5^m.42^s.5 s. pr.
15 Lyncis, dup., 4^m.9, 6^m.2, 0^s.7 δ Gemin., comp. 8^m.7, 7^s.0 s. pr. ζ Cancri, triple; binary 5^m.6, 6^m.3, 1^s.
ε Can. Maj., comp. 9^m.7, 8 s. f. σ Argus, star 8^m.22^s.4 n. f. with comp. 6^m.0, 5^s.4 s. f.
ζ Gemin., var., 10^d.15, 3^m.7-4^m.3 κ Gemin., comp. 8^m.5, 6^s.6 s. pr.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page x remain to be applied to reduce to the positions of the stars.

222 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
ε Argus	1.7	K0p	8 20 56.114	+1.2330	-.0042	-59 15 40.88	-11.557	+0.008
30 Monocerotis	4.0	A0	8 21 48.864	+2.9993	-.0039	- 3 39 15.24	11.646	-0.019
θ Chamæleontis	4.3	K0	8 22 58.588	-1.7605	-.0451	-77 14 12.40	11.692	+0.018
ο Ursæ Majoris	3.5	G0	8 23 52.980	+5.0060	-.0160	+60 58 37.57	11.886	-0.112
Groombridge 1450	6.0	K0	8 27 54.983	3.9071	-.0082	+38 16 53.85	12.236	-0.179
η Cancrī	5.5	K0	8 28 15.551	+3.4733	-.0025	+20 42 13.38	-12.136	-0.055
Groombridge 1446	6.3	K0	8 31 11.094	6.7271	-.0043	+73 54 2.23	12.402	-0.117
δ Hydræ	4.2	A0	8 33 34.886	3.1776	-.0018	+ 5 58 23.59	12.464	-0.014
σ Hydræ	4.5	K0	8 34 44.072	3.1378	-.0008	+ 3 36 46.02	12.541	-0.013
γ Cancrī	4.7	A0	8 38 50.012	3.4757	-.0071	+21 44 47.14	12.849	-0.043
δ Cancrī	4.2	K0	8 40 18.735	+3.4128	-.0009	+18 26 17.66	-13.145	-0.240
α Pyxidīs	3.7	B2	8 40 29.851	2.4112	-.0003	-32 54 29.08	12.907	+0.011
ι Cancrī	4.2	G5	8 42 2.557	3.6363	-.0006	+29 2 33.24	13.071	-0.051
δ Argus	2.0	A0	8 42 34.411	1.6516	-.0035	-54 25 33.38	13.156	-0.100
ε Hydræ	3.5	F8	8 42 42.017	3.1792	-.0127	+ 6 42 8.33	13.116	-0.048
σ ² Cancrī (mean)	5.5	K0	8 49 33.092	+3.6662	+0.034	+30 52 19.37	-13.535	-0.021
ζ Hydræ	3.3	K0	8 51 19.547	3.1739	-.0060	+ 6 14 22.14	13.621	+0.007
ι Ursæ Majoris	3.1	A5	8 53 56.681	4.1192	-.0435	+48 20 42.05	14.043	-0.248
α Cancrī	4.3	A3	8 54 16.697	3.2838	+0.021	+12 9 23.85	13.857	-0.042
δ ¹ Carinæ	5.1	B3	8 55 5.306	1.4677	-.0034	-58 55 54.95	13.886	-0.019
κ Ursæ Majoris	3.7	A0	8 58 22.649	+4.1072	-.0027	+47 27 43.55	-14.140	-0.067
κ Cancrī	5.1	B8	9 3 34.737	3.2519	-.0012	+10 58 44.10	14.406	-0.013
σ ² Ursæ Majoris	4.9	F8	9 3 38.535	5.3115	-.0003	+67 26 54.84	14.164	-0.066
λ Argus	2.2	K5	9 5 9.789	2.2066	-.0015	-43 7 16.74	11.496	-0.007
θ Hydræ	3.8	A0	9 10 21.600	3.1231	+0.088	+ 2 38 23.94	15.112	-0.312
β Argus	1.8	A0	9 12 21.673	+0.6670	-.0310	-69 23 59.76	-14.823	+0.094
83 Cancrī	6.6	F5	9 14 41.249	3.3525	-.0076	+18 1 57.25	15.189	-0.136
ι Argus	2.2	F0	9 15 1.614	1.8039	-.0055	-58 57 5.93	15.066	+0.006
40 Lyncis	3.3	K5	9 16 22.178	3.6614	-.0178	+34 43 8.64	15.137	+0.012
θ Pyxidīs	4.9	Ma	9 18 4.792	2.6516	-.0048	-25 38 15.04	15.279	-0.032
α Hydræ	2.2	K2	9 23 48.242	+2.9486	-.0010	- 8 19 26.59	-15.531	+0.033
h Ursæ Majoris	3.8	F0	9 25 28.747	4.7570	+0.0183	+63 23 58.61	15.635	+0.024
ψ Argus	3.6	F5	9 27 39.840	2.3599	-.0181	-40 7 45.88	15.739	+0.038
d Ursæ Majoris	4.6	G0	9 27 42.288	5.3469	-.0111	+70 10 11.88	15.708	+0.071
ο Ursæ Majoris	3.3	F8	9 27 43.080	4.0260	-.1026	+52 1 45.23	16.323	-0.542
ξ Leonis	5.1	G5	9 27 47.866	+3.2361	-.0063	+11 38 29.73	-15.868	-0.084
10 Leonis Minoris	4.6	G5	9 29 30.754	3.6828	+0.0111	+36 44 25.23	15.898	-0.021
ο Leonis	3.8	F5p	9 37 2.597	3.2043	-.0096	+10 14 36.48	16.303	-0.033
ο Antilæ	5.0	F5	9 40 46.120	2.6735	-.0036	-27 24 58.79	16.429	+0.029
ε Leonis	3.1	G0p	9 41 29.053	3.4095	-.0034	+24 7 45.98	16.516	-0.022
ν Argus	3.2	F0	9 45 10.693	+1.5004	-.0025	-64 42 52.85	-16.692	-0.017
ν Ursæ Majoris	3.9	F0	9 45 31.763	4.2857	-.0382	+59 24 6.48	16.850	-0.157
6 Sextantis	6.0	A3	9 47 21.283	3.0243	+0.0111	- 3 52 54.40	16.809	-0.028
μ Leonis	4.1	K0	9 48 23.252	3.4156	-.0171	+26 22 13.26	16.884	-0.054
Groombridge 1586	6.0	K0	9 51 32.113	5.4131	-.0197	+73 14 47.60	17.037	-0.060
19 Leonis Minoris	5.2	F5	9 52 58.498	+3.6822	-.0111	+41 25 23.30	-17.066	-0.022
φ Argus	3.7	B5	9 54 9.372	2.1023	-.0033	-54 12 3.80	17.119	-0.020
π Leonis	4.9	Ma	9 56 8.750	3.1716	-.0029	+ 8 24 51.45	17.215	-0.027
η Leonis	3.6	A0p	10 3 8.129	3.2717	-.0022	+17 8 19.59	17.499	-0.004
α Leonis (Regulus)	1.3	B8	10 4 16.407	3.1974	-.0169	+12 20 38.76	17.545	-0.002
λ Hydræ	3.8	K0	10 6 50.052	+2.9248	-.0137	-11 58 22.28	-17.738	-0.088
q Velorum	4.1	A2	10 11 29.967	2.5139	-.0153	-41 44 24.10	17.808	+0.032
ξ Leonis	3.6	F0	10 12 24.686	3.3408	+0.0014	+23 48 5.86	17.885	-0.009
λ Ursæ Majoris	3.5	A0	10 12 27.672	3.6280	-.0142	+43 17 58.50	17.917	-0.038
32 Ursæ Majoris	5.7	A3	10 12 27.764	4.3844	-.0140	+65 29 35.55	17.891	-0.012
γ Leonis pr.	2.6	K0	10 15 43.803	+3.3104	+0.0212	+20 13 53.80	-18.158	-0.152
μ Ursæ Majoris	3.2	K5	10 17 44.951	+3.5831	-.0068	+41 53 14.45	-18.056	+0.027

ι Cancrī, star 6^m.0, 30".6 n. pr.δ Argus, comp. 5^m.2, 2" s.ε Hydræ, triple; binary 3^m.5, 6^m.8, 0".2, with comp. 7^m.8, 3".3σ² Cancrī, dup., 5^m.9, 6^m.4, 1".4δ¹ Carinæ, comp. 7^m.2, 5" f.σ² Urs. Maj., binary, 4^m.9, 8^m.1, 3".3ψ Argus, dup., 3^m.8, 6^m.0, 0".8ν Argus, comp. 6^m.0, 4".9 s. f.γ Leonis, comp. 3^m.8, 3".7 s. f.

MEAN PLACES OF TEN-DAY STARS, 1923. 223

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
30 II. Ursæ Majoris . . .	4.9	A0	10 18 36.299	+4.3528	-.0024	+65 57 23.48	-18.133	-0.018
μ Hydræ	4.1	K5	10 22 21.941	2.9009	-.0089	-16 26 33.63	18.332	-0.079
31 Leonis Minoris . . .	4.4	K0	10 23 26.244	3.4768	-.0094	+37 6 8.02	18.404	-0.112
α Antliæ	4.4	K5	10 23 37.572	2.7432	-.0060	-30 40 32.45	18.321	-0.023
36 Ursæ Majoris . . .	4.8	F5	10 25 42.717	3.8556	-.0208	+56 22 33.32	18.411	-0.039
9 H. Draconis	5.0	G5	10 28 35.776	+5.1631	-.0084	+76 6 37.21	-18.481	-0.009
ρ Leonis	3.8	B0p	10 28 45.526	3.1610	-.0004	+ 9 42 12.08	18.481	-0.003
33 Sextantis	6.4	K0	10 37 29.148	3.0518	-.0100	- 1 20 9.99	18.870	-0.110
41 Leonis Minoris . . .	5.0	A2	10 39 13.973	3.2658	-.0084	+23 35 31.12	18.803	+0.009
θ Argus	3.0	B0	10 40 12.289	2.1340	-.0043	-63 59 28.90	18.869	-0.027
42 Leonis Minoris . . .	5.4	B9	10 41 35.262	+3.3407	-.0024	+31 5 17.81	-18.924	-0.041
η Argus	† var.	Pec.	10 42 4.166	2.3226	-.0002	-59 16 46.00	18.906	-0.009
μ Argus	† 2.8	G5	10 43 27.206	2.5751	+0.0666	-49 0 48.02	19.018	-0.081
δ ² Chamæleontis . . .	† 4.6	B3	10 45 4.551	0.5890	-.0192	-80 8 2.56	18.987	-0.004
l Leonis	5.3	A0	10 45 12.722	3.1558	+0.0001	+10 57 10.57	19.020	-0.033
ν Hydræ	3.3	Ma	10 45 49.441	+2.9586	+0.0661	-15 47 24.41	-18.793	+0.211
46 Leonis Minoris . . .	3.9	K0	10 49 0.646	3.3615	+0.0074	+34 37 49.49	19.374	-0.283
54 Leonis	† 4.5	A0	10 51 26.832	3.2517	-.0060	+25 9 38.91	19.173	-0.018
ι Antliæ	4.7	K0	10 53 7.888	2.7972	+0.0112	-36 43 24.88	19.335	-0.138
Groombridge 1706 . . .	6.3	G5	10 53 50.490	4.8617	-.0264	+78 10 59.07	19.251	-0.035
α Crateris	4.2	K0	10 56 1.263	+2.9212	-.0327	-17 53 19.21	-19.161	+0.108
d Leonis	5.0	K0	10 56 35.074	3.0989	+0.0001	+ 4 1 52.28	19.305	-0.022
β Ursæ Majoris	2.4	A0	10 57 12.420	3.6357	+0.0105	+56 47 43.75	19.271	+0.026
α Ursæ Majoris	2.0	K0	10 58 59.480	3.7222	-.0161	+62 10 1.27	19.410	-0.071
χ Leonis	4.7	F0	11 1 2.780	3.0957	-.0234	+ 7 45 9.85	19.426	-0.040
p ⁴ Leonis	5.7	K0	11 2 58.613	+3.0611	-.0253	+ 2 22 26.23	-19.508	-0.080
ψ Ursæ Majoris	3.2	K0	11 5 20.538	3.3822	-.0053	+44 54 59.76	19.510	-0.033
β Crateris	4.5	A2	11 7 52.114	2.9185	.0000	-22 24 19.20	19.635	-0.106
δ Leonis	2.6	A2	11 10 0.991	3.1942	+0.0108	+20 56 44.76	19.711	-0.141
θ Leonis	3.4	A0	11 10 12.060	3.1497	-.0049	+15 51 2.38	19.658	-0.085
ν Ursæ Majoris	3.7	K0	11 14 19.478	+3.2462	-.0018	+33 30 53.03	-19.622	+0.026
δ Crateris	3.8	K0	11 15 29.362	2.9979	-.0088	-14 21 42.01	19.473	+0.195
σ Leonis	4.1	A0	11 17 10.029	3.0947	-.0062	+ 6 27 5.86	19.708	-0.013
π Centauri	4.3	B5	11 17 29.365	2.7286	-.0041	-54 4 7.93	19.714	-0.013
ι Leonis	† 4.0	F5	11 19 54.661	3.1281	+0.0103	+10 57 12.75	19.822	-0.083
τ Leonis	5.2	K0	11 23 58.670	+3.0856	+0.0008	+ 3 16 49.80	-19.814	-0.016
λ Draconis	4.1	Ma	11 26 51.176	3.5878	-.0072	+69 45 22.43	19.856	-0.021
ξ Hydræ	3.7	G5	11 29 12.687	2.9476	-.0158	-31 25 53.52	19.919	-0.055
λ Centauri	3.3	B9	11 32 13.157	2.7538	-.0073	-62 35 37.41	19.924	-0.027
υ Leonis	4.5	K0	11 33 0.371	3.0716	.0000	- 0 23 54.53	19.867	+0.039
π Chamæleontis	5.7	F0	11 34 4.471	+2.4584	-.0321	-75 28 13.09	-19.939	-0.023
3 Draconis	5.5	K0	11 38 11.606	3.3664	-.0080	+67 10 16.08	19.920	+0.035
ζ Crateris	4.9	G5	11 40 51.458	3.0385	+0.0018	-17 55 21.38	20.016	-0.041
χ Ursæ Majoris	3.8	K0	11 41 59.519	3.1773	-.0128	+48 12 22.96	19.963	+0.020
β Leonis (<i>Denebola</i>) . .	2.2	A2	11 45 8.025	3.0619	-.0341	+15 0 9.20	20.121	-0.118
β Virginis	3.8	F8	11 46 41.062	+3.1252	+0.0494	+ 2 11 55.45	-20.286	-0.275
Groombridge 1830 . . .	6.5	G5	11 48 32.807	3.4652	+0.3398	+38 16 17.28	25.804	-5.784
γ Ursæ Majoris	2.5	A0	11 49 47.360	3.1666	+0.0115	+54 7 22.35	20.021	+0.004
π Virginis	4.6	A3	11 56 55.625	3.0741	-.0009	+ 7 2 37.27	20.075	-0.032
ο Virginis	4.2	G5	12 1 17.249	3.0568	-.0148	+ 9 9 37.87	20.012	+0.032
δ Centauri	2.9	B3p	12 4 21.570	+3.0983	-.0050	-50 17 37.62	-20.071	-0.030
ε Corvi	3.2	K0	12 6 9.698	3.0824	-.0051	-22 11 29.81	20.035	+0.003
4 H. Draconis	5.1	A5	12 8 36.701	2.8383	+0.0026	+78 2 38.64	20.011	+0.019
δ Crucis	3.1	B3	12 11 3.130	3.1792	+0.0021	-58 19 15.69	20.060	-0.038
δ Ursæ Majoris	3.4	A2	12 11 37.514	2.9815	+0.0149	+57 27 37.41	20.014	+0.005
γ Corvi	2.8	B8	12 11 50.598	+3.0826	-.0114	-17 6 51.85	-20.002	+0.017
2 Canum Venaticorum †	5.8	K5	12 12 16.445	+3.0142	+0.0038	+41 5 18.89	-20.062	-0.046

η Argus, var. irreg., 1^m.6-6^m.6
μ Argus, comp. 7^m, 2["].2 n. f.

δ³ Cham., star 5^m.5 pr. 32["], 258["] n.
54 Leonis, comp. 6^m.3, 6["].4, s. f.

ι Leonis, comp. 6^m.8, 2["].6 n. f.
2 Can. Ven., star 8^m, 11["].6 s. pr.

224 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Variation.	Annual P. M.	Declination.	Annual Variation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
β Chamæleontis . . .	4.4	B5	12 13 47.568	+3.4630	-.0188	-78 53 4.89	-19.992	+0.017
η Virginis . . .	4.0	A0	12 15 57.985	3.0696	-.0036	- 0 14 20.45	20.024	-0.027
α^1 Crucis . . .	1.6	B1	12 22 18.075	3.3176	-.0064	-62 40 21.37	19.990	-0.039
α^2 Crucis . . .	2.1		$\Delta\alpha + 0.620$	...	...	$\Delta\delta - 1.78$	...	...
20 Comæ . . .	5.7	A2	12 25 51.324	3.0177	+0.0036	+21 19 20.45	19.953	-0.036
δ Corvi . . .	3.1	A0	12 25 52.676	+3.1022	-.0140	-16 5 12.89	-20.066	-0.149
γ Crucis . . .	1.6	Mb	12 26 52.865	3.3079	-.0028	-56 40 55.26	20.168	-0.281
κ Canum Venaticorum	4.3	G0	12 30 5.470	2.8549	-.0616	+41 46 32.25	19.593	+0.279
κ Draconis . . .	3.9	B5p	12 30 12.375	2.5735	-.0112	+70 12 45.08	19.861	+0.010
β Corvi . . .	2.8	G5	12 30 20.283	3.1468	-.0008	-22 58 16.00	19.931	-0.061
24 Comæ seq. . .	5.2	K0	12 31 16.094	+3.0102	-.0007	+18 48 2.42	-19.846	+0.013
α Muscæ . . .	2.9	B3	12 32 34.353	3.5497	-.0088	-68 42 41.42	19.872	-0.029
χ Virginis . . .	4.8	K0	12 35 16.201	3.0944	-.0056	- 7 34 19.38	19.839	-0.031
γ Centauri . . .	2.4	A0	12 37 15.733	3.2980	-.0196	-48 32 13.90	19.800	-0.020
γ Virginis (mean) . .	2.9	F0	12 37 45.530	3.0401	-.0365	- 1 1 38.25	19.770	+0.004
ρ Virginis . . .	5.0	A0	12 37 59.272	+3.0371	+0.0058	+10 39 34.61	-19.877	-0.107
76 Ursæ Majoris . . .	5.9	A0	12 38 12.429	2.6285	-.0065	+63 8 8.16	19.785	-0.018
β Crucis . . .	1.5	B1	12 43 12.560	3.4877	-.0064	-59 16 5.49	19.723	-0.033
31 Comæ . . .	5.1	G0	12 47 56.948	2.9232	-.0022	+27 57 33.71	19.632	-0.024
n Centauri . . .	4.3	A5	12 49 9.948	3.3151	+0.0060	-39 45 37.51	19.620	-0.035
ϵ Ursæ Majoris (Alioth)	1.7	A0p	12 50 38.817	+2.6460	+0.0138	+56 22 39.03	-19.570	-0.013
δ Virginis . . .	3.7	Ma	12 51 43.434	3.0210	-.0318	+ 3 48 56.19	19.597	-0.060
α Canum Venat. seq. .	2.9	A0p	12 52 25.715	2.8094	-.0203	+38 44 2.12	19.474	+0.049
δ Muscæ . . .	3.6	K2	12 56 56.736	4.0843	+0.0197	-71 8 1.95	19.460	-0.031
ϵ Virginis . . .	3.0	K0	12 58 20.632	2.9864	-.0186	+11 22 21.64	19.381	+0.015
θ Virginis . . .	4.4	A0	13 5 57.657	+3.1039	-.0029	- 5 7 41.85	-19.260	-0.040
43 Comæ . . .	4.3	G0	13 8 16.932	2.8019	-.0599	+28 16 5.32	18.283	+0.878
20 Canum Venaticorum	4.7	F0	13 14 5.617	2.6946	-.0094	+40 58 39.64	18.991	+0.015
γ Hydræ . . .	3.3	G5	13 14 43.877	3.2570	+0.0046	-22 45 56.48	19.011	-0.053
ι Centauri . . .	2.9	A2	13 16 15.645	3.3641	-.0294	-36 18 23.68	19.042	-0.097
ζ^1 Ursæ Maj. (Mizar) .	2.4	A0p	13 20 49.777	+2.4208	+0.0153	+55 19 37.61	-18.811	-0.030
ζ^2 Ursæ Majoris . . .	4.0	A0	$\Delta\alpha + 0.920$	...	...	$\Delta\delta - 12.43$	...	...
α Virginis (Spica) . .	1.2	B2	13 21 8.036	3.1580	-.0028	-10 45 35.23	18.834	-0.032
Groombridge 2001 . . .	6.1	K5	13 24 10.063	1.5249	+0.0012	+72 47 27.52	18.727	-0.019
70 Virginis . . .	5.2	G5	13 24 39.831	2.9340	-.0168	+14 11 22.54	19.277	-0.032
ξ Virginis . . .	3.4	A2	13 30 46.064	+3.0550	-.0195	- 0 12 9.52	-18.454	+0.039
17 H. Canum Venaticorum	5.0	F0	13 31 21.660	2.6810	+0.0073	+37 34 45.65	18.477	-0.004
ϵ Centauri . . .	2.6	B1	13 34 59.828	3.7850	-.0039	-53 4 32.27	18.387	-0.039
m Virginis . . .	5.2	Ma	13 37 34.075	3.1461	-.0073	- 8 18 53.93	18.223	+0.032
τ Boötis . . .	4.5	F5	13 43 36.176	2.8508	-.0341	+17 50 23.73	18.005	+0.026
η Ursæ Majoris (Alkaid)	1.9	B3	13 44 30.546	+2.3672	-.0118	+49 41 49.43	-18.019	-0.023
89 Virginis . . .	5.1	K0	13 45 41.016	3.2554	-.0077	-17 45 4.11	17.992	-0.041
ξ Centauri . . .	3.1	B2p	13 50 43.591	3.7294	-.0070	-46 54 36.33	17.814	-0.064
η Boötis . . .	2.8	G0	13 51 1.108	2.8567	-.0044	+18 46 59.32	18.102	-0.363
11 Boötis . . .	6.1	A3	13 57 41.057	2.7213	-.0060	+27 45 28.26	17.455	+0.005
θ Virginis . . .	4.3	A2	13 57 43.578	+3.0518	+0.0010	+ 1 54 59.59	-17.487	-0.029
τ Apodis . . .	var.	Mb	13 57 46.229	5.7641	-.0293	-76 25 33.80	17.485	-0.029
β Centauri . . .	0.9	B1	13 58 22.493	4.2126	-.0033	-60 0 8.35	17.463	-0.033
π Hydræ . . .	3.5	K0	14 1 58.907	3.4112	+0.0031	-26 18 43.73	17.418	-0.146
θ Centauri . . .	2.3	K0	14 2 8.646	3.5222	-.0437	-35 59 30.63	17.790	-0.525
α Draconis . . .	3.6	A0	14 2 18.301	+1.6248	-.0071	+64 44 36.51	-17.247	+0.011
d Boötis . . .	4.8	F5	14 6 53.285	2.7369	-.0014	+25 27 20.49	17.128	-0.078
κ Virginis . . .	4.3	K0	14 8 47.140	+3.1978	+0.0006	- 9 54 57.61	16.830	+0.132
4 Ursæ Minoris . . .	5.0	K0	14 9 7.406	-0.2697	-.0108	+77 54 33.35	16.921	+0.026
ι Virginis . . .	4.2	F5	14 11 58.450	+3.1433	-.0012	- 5 38 1.30	17.240	-0.427
α Boötis (Arcturus) . .	0.2	K0	14 12 8.915	+2.7357	-.0779	+19 34 57.51	-18.808	-2.004
λ Boötis . . .	4.3	A0	14 13 27.503	+2.2827	-.0172	+46 26 28.69	-16.591	+0.151

δ Corvi, star 8^m, 24".4 s. pr.
 γ Crucis, star 6^m.6, 85" n. f.
 24 Comæ, star 6^m.7, 20".6 pr.
 γ Cent., dup., 3^m.1, 3^m.1, 1".7

γ Virginis, binary, 3^m.7, 3^m.7, 6".4,
 P=323^s
 α Can. Ven., star 5^m, 19".8 s. pr.
 θ Virginis, comp. 9^m, 7".1 n. pr.

ζ^1 Urs. Maj., star Alcor 4^m.0, f. 78^m.9,
 222" n.
 θ Apodis, var. irreg., 5^m.5-6^m.6

MEAN PLACES OF TEN-DAY STARS, 1923. 225

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
λ Virginis	4.6	A2	14 14 56.361	+3.2419	-.0024	-13 1 2.65	-16.649	+0.021
2 Libræ	6.3	K0	14 19 16.824	3.2248	-.0014	-11 21 47.08	16.522	-0.067
θ Boötis	4.1	F8	14 22 34.589	2.0432	-.0254	+52 12 21.99	16.695	-0.406
f Boötis	5.4	A5	14 22 52.444	2.7902	-.0052	+19 34 20.51	16.260	+0.015
φ Virginis†	5.0	K0	14 24 13.995	+3.0897	-.0090	- 1 53 0.45	16.209	-0.004
5 Ursæ Minoris	4.4	K2	14 27 40.037	-0.1535	+0.0022	+76 2 18.11	-16.005	+0.021
ρ Boötis	3.8	K0	14 28 30.727	+2.5864	-.0073	+30 42 31.48	15.868	+0.113
γ Boötis	3.0	F0	14 28 58.702	2.4170	-.0091	+38 38 40.00	15.812	+0.145
γ Centauri	2.6	B3p	14 30 36.617	3.8000	-.0032	-41 49 13.39	15.902	-0.032
σ Boötis	4.5	F0	14 31 19.714	2.6130	+0.0150	+30 4 44.32	15.707	+0.125
α Centauri†	0.1	G0	14 34 21.402	+4.0605	-.4866	-60 31 6.45	-14.947	+0.721
33 Boötis	5.4	A0	14 35 58.373	2.2340	-.0056	+44 44 9.76	15.623	-0.043
α Apogis	3.8	K5	14 38 12.870	7.3302	-.0088	-78 43 10.47	15.479	-0.024
μ Virginis	4.0	F5	14 39 0.005	3.1595	+0.0071	- 5 19 27.25	15.733	-0.322
ε Boötis†	2.7	K0p	14 41 37.456	2.6203	-.0035	+27 23 53.00	15.254	+0.009
109 Virginis	3.8	A0	14 42 21.276	+3.0318	-.0074	+ 2 12 59.58	-15.257	-0.035
8 Libræ	5.3	F5	14 46 25.445	3.3115	-.0073	-15 40 40.47	15.062	-0.074
α Libræ	2.9	A2	14 46 36.895	3.3150	-.0078	-15 43 21.59	15.054	-0.077
Groombridge 2164	5.7	K2	14 49 29.048	+1.5209	-.0165	+59 36 23.04	14.692	+0.118
β Ursæ Minoris	2.2	K5	14 50 54.862	-0.1967	-.0065	+74 28 12.48	14.722	+0.003
Piazzi 221	5.8	A0	14 52 35.073	+2.8300	-.0021	+14 45 23.96	-14.636	-0.011
ξ ² Libræ	5.6	K0	14 52 35.187	3.2515	-.0006	-11 5 59.34	14.626	-0.001
β Lupi	2.8	B2p	14 53 28.669	3.9192	-.0070	-42 49 29.92	14.634	-0.062
δ Libræ†	var.	A0	14 56 51.305	3.2022	-.0051	- 8 12 51.49	14.382	-0.015
β Boötis	3.6	G5	14 59 2.742	2.2600	-.0036	+40 41 36.77	14.273	-0.040
γ Scorpii	3.4	Ma	14 59 33.547	+3.5065	-.0056	-24 58 48.75	-14.249	-0.048
ψ Boötis	4.7	K0	15 1 8.757	2.5701	-.0133	+27 14 49.48	14.117	-0.014
c Boötis	5.0	F0	15 3 55.135	2.6348	+0.0136	+25 10 5.37	14.114	-0.184
ζ Lupi	3.5	K0	15 6 44.585	4.2961	-.0126	-51 48 25.62	13.817	-0.066
i Libræ	4.7	A0p	15 7 49.683	3.4155	-.0031	-19 30 5.06	13.735	-0.053
3 Serpentis	5.4	K0	15 11 21.589	+2.9805	-.0017	+ 5 13 27.58	-13.459	-0.005
γ Trianguli Australis	3.1	A0	15 11 41.719	5.5639	-.0137	-68 23 48.13	13.474	-0.042
δ Boötis	3.5	K0	15 12 23.922	2.4194	+0.0075	+33 36 4.47	13.512	-0.125
β Libræ	2.7	B8	15 12 51.646	+3.2258	-.0066	- 9 5 59.08	13.381	-0.024
γ Ursæ Minoris	3.1	A2	15 20 50.387	-0.1099	-.0020	+72 6 28.60	12.815	+0.013
μ Boötis pr.†	4.5	F0	15 21 34.894	+2.2665	-.0121	+37 38 47.28	-12.697	+0.081
τ ¹ Serpentis	5.5	Ma	15 22 13.004	2.7803	-.0024	+15 41 52.14	12.760	-0.024
i Draconis	3.5	K0	15 23 12.997	1.3344	+0.0014	+59 14 6.99	12.658	+0.010
32 Libræ	5.9	K0	15 23 54.630	3.3799	+0.0006	-16 26 56.75	12.664	-0.043
β Coronæ Borealis	3.7	Fp	15 24 39.266	2.4740	-.0130	+29 22 13.09	12.492	+0.078
ν ¹ Boötis	5.2	K5	15 28 9.814	+2.1554	+0.0016	+41 5 41.24	-12.344	-0.014
γ Lupi (mean)†	3.0	B3	15 30 0.161	3.9895	-.0020	-40 54 33.62	12.251	-0.049
γ Libræ	4.0	K0	15 31 12.974	3.3534	+0.0047	-14 32 1.05	12.111	+0.007
α Coronæ Borealis	2.3	A0	15 31 25.629	2.5396	+0.0090	+26 58 22.53	12.203	-0.100
ζ Coronæ Borealis seq. †	5.1	B8	15 36 28.710	2.2598	-.0005	+36 53 6.12	11.760	-0.012
α Serpentis	2.8	K0	15 40 28.422	+2.9535	+0.0089	+ 6 40 0.90	-11.421	+0.043
β Serpentis	3.7	A2	15 42 38.026	2.7688	+0.0054	+15 39 42.43	11.363	-0.055
κ Serpentis	4.3	K5	15 45 16.362	2.6998	-.0035	+18 22 42.00	11.216	-0.100
12 H. Draconis	5.1	A2	15 45 29.318	0.9090	+0.0047	+62 50 13.63	11.169	-0.068
μ Serpentis	3.6	A0	15 45 35.979	+3.1291	-.0058	- 3 11 44.17	11.121	-0.028
ζ Ursæ Minoris	4.3	A2	15 46 46.529	-2.1878	+0.0082	+78 1 55.35	-11.010	-0.004
ε Serpentis	3.8	A0	15 46 58.557	+2.9889	+0.0081	+ 4 42 31.26	10.922	+0.070
β Trianguli Australis	3.0	F0	15 48 20.575	5.2641	-.0290	-63 11 40.84	11.300	-0.408
λ Libræ	5.1	B3	15 48 51.619	3.4786	-.0017	-19 56 17.49	10.900	-0.016
γ Serpentis	3.9	F8	15 52 53.726	2.7702	+0.0212	+15 54 43.12	11.844	-1.289
π Scorpii	3.0	B2p	15 54 11.390	+3.6252	-.0010	-25 53 37.23	-10.508	-0.048
ε Coronæ Borealis	4.2	K0	15 54 23.903	+2.4825	-.0065	+27 5 59.78	-10.511	-0.067

φ Virginis, comp. 9^m.4, 4".5 s. f. .
 ε Boötis, comp. 5^m.1, 2".8 n. pr.

δ Libræ, var., 2^d.33, 4^m.8-6^m.2
 β Boötis, star 6^m.7, 108".5.

γ Lupi, binary, 3^m.7, 3^m.9, 0".4
 γ Cor. Bor., comp. 6^m.0, 6".2 n. pr.

α Centauri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page x remain to be applied to reduce to the position of α² Centauri.

226 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
δ Scorp̄ii	2.5	B1p	15 55 46.590	+3.5436	-.0011	-22 24 13.52	-10.375	-0.035
θ Draconis	4.1	F8	16 0 26.712	1.1228	-.0392	+58 46 13.86	9.850	+0.338
β Scorp̄ii	2.9	B1	16 0 57.345	3.4846	-.0011	-19 35 44.95	9.978	-0.028
κ Herculis	5.3	G5	16 4 35.869	2.7054	-.0039	+17 15 3.21	9.696	-0.023
Groombridge 2320	5.4	A0	16 6 6.401	0.1560	-.0074	+68 0 45.96	9.505	+0.052
φ Herculis	4.3	A0	16 6 20.604	+1.8901	-.0017	+45 8 10.07	-9.502	+0.036
δ ¹ Apod̄is	4.8	Mb	16 8 46.943	8.8803	-.0050	-78 30 17.06	9.406	-0.056
δ Ophiuch̄i	3.0	Ma	16 10 18.507	3.1421	-.0031	-3 29 49.54	9.376	-0.144
σ Coronæ Bor. seq.	5.8	G0	16 11 47.664	+2.2461	-.0223	+34 3 11.21	9.188	-0.072
19 Ursæ Minoris	5.5	B8	16 12 59.965	-1.7384	+0.0007	+76 4 19.04	9.014	+0.008
γ ² Normæ	4.1	K0	16 14 4.037	+4.4750	-.0216	-49 58 5.39	-9.002	-0.064
ε Ophiuch̄i	3.3	K0	16 14 14.704	3.1725	+0.0054	-4 30 21.23	8.888	-0.037
σ Scorp̄ii	3.1	B1	16 16 30.275	3.6128	-.0011	-25 24 33.63	8.786	-0.039
τ Herculis	3.9	B5	16 17 25.576	1.8035	+0.0001	+46 29 45.54	8.646	+0.029
γ Herculis	3.8	F0	16 18 31.350	+2.6457	-.0031	+19 19 58.50	8.552	+0.037
η Ursæ Minoris	5.0	F0	16 19 44.032	-1.7811	-.0232	+75 56 0.14	-8.240	+0.252
γ Apod̄is	3.9	K0	16 21 35.333	+9.1277	-.0408	-78 43 38.22	8.428	-0.083
ω Herculis	4.5	Ap	16 21 51.418	2.7622	-.0028	+14 12 34.42	8.383	-0.059
η Draconis	2.9	G5	16 22 56.743	0.8093	-.0020	+61 41 17.36	8.179	+0.058
α Scorp̄ii (Antares)	1.2	Map	16 24 40.972	3.6753	-.0006	-26 15 44.61	8.127	-0.028
β Herculis	2.8	K0	16 26 54.497	+2.5777	-.0076	+21 39 22.77	-7.945	-0.025
λ Ophiuch̄i	3.8	A0	16 27 1.700	+3.0211	-.0022	+ 2 9 4.93	7.989	-0.079
α Draconis	5.0	B8p	16 28 7.559	-0.1264	-.0019	+68 56 5.13	7.786	+0.036
τ Scorp̄ii	2.9	B0	16 31 5.124	+3.7308	-.0013	-28 3 27.44	7.617	-0.034
σ Herculis	4.2	A0	16 31 37.218	1.9338	-.0006	+42 35 41.67	7.514	+0.026
ζ Ophiuch̄i	2.7	B0	16 32 55.002	+3.3015	+0.0007	-10 24 44.23	-7.412	+0.022
24 Scorp̄ii	5.0	K0	16 37 7.022	3.4671	-.0017	-17 35 39.47	7.096	-0.004
ζ Herculis	3.0	G0	16 38 22.987	2.2616	-.0364	+31 44 29.24	6.599	+0.390
η Herculis	3.6	K0	16 40 15.320	2.0561	+0.0031	+39 4 4.15	6.928	-0.093
α Trianguli Australis	1.9	K2	16 40 29.723	6.3306	+0.0028	-68 53 18.81	6.861	-0.019
Groombridge 2377	4.9	F0	16 43 50.173	+1.1381	+0.0015	+56 55 8.61	-6.478	+0.062
ε Scorp̄ii	2.4	K0	16 45 10.311	3.8810	-.0505	-34 9 17.97	6.693	-0.264
49 Herculis	6.4	A0	16 48 34.466	2.7305	+0.0010	+15 6 8.06	6.160	-0.014
ε ¹ Aræ	4.2	K2	16 53 26.384	4.7735	-.0011	-53 2 38.62	5.756	-0.017
κ Ophiuch̄i	3.4	K0	16 54 1.345	2.8385	-.0199	+ 9 29 37.11	5.702	-0.011
30 Ophiuch̄i	5.0	K0	16 56 59.978	+3.1634	-.0017	-4 6 29.75	-5.517	-0.076
ε Herculis	3.9	A0	16 57 20.574	2.2949	-.0036	+31 2 19.92	5.389	+0.023
d Herculis	5.3	A2	16 58 45.690	2.2123	-.0016	+33 40 43.62	5.301	-0.090
η Ophiuch̄i	2.6	A0	17 5 57.577	3.4380	+0.0017	-15 37 50.88	4.591	+0.091
η Scorp̄ii	3.4	F2	17 6 38.078	4.2936	+0.0023	-43 8 21.84	4.931	-0.306
ζ Draconis	3.2	B5	17 8 33.663	+0.1705	-.0021	+65 48 33.61	-4.444	+0.018
α Herculis	var.	Mb	17 11 8.138	2.7347	-.0008	+14 28 37.12	4.212	+0.029
δ Herculis	3.2	A0	17 11 52.076	2.4634	-.0019	+24 55 44.52	4.337	-0.158
π Herculis	3.4	K2	17 12 21.847	2.0887	-.0025	+36 53 42.27	4.137	-0.001
θ Ophiuch̄i	3.4	B3	17 17 16.713	3.6824	-.0006	-24 55 26.73	3.751	-0.036
w Herculis	5.4	G0	17 17 46.625	+2.2433	+0.0096	+32 33 56.91	-4.719	-1.047
β Aræ	2.8	K2	17 18 53.716	4.9826	-.0004	-55 27 31.53	3.603	-0.027
b Ophiuch̄i	4.3	F0	17 21 39.915	3.6611	-.0009	-24 6 21.62	3.475	-0.137
σ Ophiuch̄i	4.4	K0	17 22 41.608	2.9759	+0.0002	+ 4 12 22.37	3.241	+0.008
δ Aræ	3.8	B8	17 24 8.480	5.4078	-.0097	-60 37 18.65	3.244	-0.120
α Aræ	3.0	B3p	17 25 53.175	+4.6340	-.0036	-49 49 0.67	-3.056	-0.083
λ Herculis	4.5	K0	17 27 37.567	2.4243	+0.0016	+26 10 3.87	2.804	+0.018
λ Scorp̄ii	1.7	B2	17 28 22.661	4.0716	-.0003	-37 2 56.42	2.784	-0.027
β Draconis	3.0	G0	17 28 41.520	1.3546	-.0017	+52 21 28.10	2.721	+0.009
α Ophiuch̄i	2.1	A5	17 31 21.561	2.7840	+0.0080	+12 36 53.66	2.733	-0.235
ξ Serp̄entis	3.6	A5	17 33 10.541	+3.4333	-.0038	-15 21 4.49	-2.401	-0.060
ι Herculis	3.8	B3	17 37 17.489	+1.6938	+0.0003	+46 2 47.89	-1.980	+0.003

β Scorp̄ii, comp. 5^m.1, 13["].3 n. f.
κ Herculis, star 6^m.5, 29["].7 n. f.
σ Cor. Bor., comp. 6^m.7, 4["].6 s. pr.
σ Scorp̄ii, star 8^m, 21["] pr.
η Draconis, comp. 8^m, 5["].4 s. f.

α Scorp̄ii, comp. 7^m, 3["].2 pr.
λ Ophiuch̄i, comp. 6^m, 1["].2 n. f.
ζ Herculis, binary, 3^m.0, 6^m.0, 1["].
η Oph., binary, 3^m.2, 3^m.7, 0["].5

α Herculis, var. irreg., 3^m.1-3^m.9,
dup., comp. 6^m, 4["].6 s. f.
δ Herculis, binary, comp. 8^m, 11["]
s. pr.

MEAN PLACES OF TEN-DAY STARS, 1923. 227

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.			Annual Vari- ation.	Annual P. M.	Declination.			Annual Vari- ation.	Annual P. M.
			h	m	s			°	'	"		
ω Draconis	4.9	F5	17 37	24.018	s	-0.3533	+0.0013	+68 47	37.10		-1.655	+0.318
η Pavonis	3.6	K0	17 38	10.213	s	+5.8829	-.0027	-64 41	21.13		1.986	-0.080
β Ophiuchi	2.9	K0	17 39	40.091	s	2.9631	-.0026	+ 4 35	54.02		1.618	+0.158
ι ¹ Scorpii	3.1	F5p	17 42	11.922	s	+4.1952	+0.0006	-40 5	55.21		1.563	-0.008
ψ Draconis †	4.9	F5	17 43	18.219	s	-1.0727	+0.0025	+72 11	13.35		1.727	-0.268
μ Herculis	3.5	G5	17 43	26.656	s	+2.3473	-.0237	+27 45	53.19		-2.196	-0.749
γ Ophiuchi	3.7	A0	17 44	1.857	s	3.0074	-.0016	+ 2 44	6.49		1.468	-0.073
ξ Draconis	3.9	K0	17 52	11.913	s	1.0383	+0.0130	+56 53	3.58		0.605	+0.077
89 Herculis	5.5	F2	17 52	18.835	s	+2.4209	+0.0013	+26 3	40.69		0.666	+0.006
35 Draconis	5.0	F5	17 52	53.661	s	-2.6894	+0.0114	+76 58	26.51		0.378	+0.213
θ Herculis	4.0	K0	17 53	36.720	s	+2.0572	+0.0006	+37 15	35.53		-0.554	+0.004
ξ Herculis	3.8	K0	17 54	46.367	s	2.3317	+0.0072	+29 15	18.99		0.475	-0.018
ν Ophiuchi	3.5	K0	17 54	47.206	s	3.3021	-.0006	- 9 45	55.47		0.576	-0.120
γ Draconis	2.4	K5	17 51	49.073	s	1.3927	-.0006	+51 29	50.46		0.177	-0.024
67 Ophiuchi	3.9	B5p	17 56	47.331	s	3.0050	+0.0008	+ 2 56	2.81		-0.294	-0.013
θ Aræ	3.9	B1	18 0	38.186	s	+4.6700	-.0010	-50 5	54.88		+0.005	-0.050
γ Sagittarii	3.1	K0	18 0	51.594	s	3.8521	-.0055	-30 25	35.40		-0.123	-0.198
70 Ophiuchi †	4.1	K0	18 1	33.750	s	3.0318	+0.0178	+ 2 30	57.88		-0.985	-1.122
72 Ophiuchi	3.7	A2	18 3	41.908	s	2.8134	-.0015	+ 9 33	6.80		+0.410	+0.087
ο Herculis	3.8	A0	18 4	32.296	s	2.3396	-.0002	+28 45	3.28		+0.399	+0.002
μ Sagittarii	4.0	B8p	18 9	9.465	s	+3.5870	-.0004	-21 4	49.14		+0.799	-0.002
η Sagittarii	3.2	Mb	18 12	25.054	s	4.0596	-.0109	-36 47	9.65		0.933	-0.153
Groombridge 2533	5.4	B5	18 13	15.041	s	1.8654	-.0006	+42 7	56.42		1.157	-0.001
36 Draconis	5.0	F5	18 13	27.224	s	0.3455	+0.0535	+64 22	15.51		1.202	+0.026
δ Sagittarii	2.8	K0	18 16	3.866	s	3.8405	+0.0023	-29 51	44.21		1.370	-0.034
η Serpentis	3.4	K0	18 17	19.465	s	+3.1029	-.0378	- 2 55	11.60		+0.822	-0.692
ε Sagittarii	2.0	A0	18 19	3.643	s	3.9813	-.0041	-34 25	20.40		1.513	-0.122
109 Herculis	3.9	K0	18 20	24.977	s	2.5561	+0.0139	+21 44	0.63		1.522	-0.261
α Telescopii	3.8	B3	18 21	15.864	s	+4.4496	-.0016	-46 0	45.06		1.789	-0.068
χ Draconis	3.7	F8	18 22	26.878	s	-1.0792	+0.1178	+72 41	58.97		1.589	-0.371
λ Sagittarii	2.9	K0	18 23	13.127	s	+3.7026	-.0033	-25 27	56.76		+1.828	-0.199
ε Serpentis	5.4	G5	18 25	40.524	s	3.1215	+0.0015	- 2 2	10.62		2.206	-0.035
1 Aquilæ	4.1	K0	18 31	1.007	s	3.2046	-.0013	- 8 17	56.80		2.389	-0.315
ζ Pavonis	4.1	K0	18 34	2.540	s	7.0163	-.0056	-71 29	47.57		2.802	-0.165
α Lyræ (Vega)	0.1	A0	18 34	19.884	s	2.0315	+0.0177	+38 42	40.19		3.272	+0.280
2 Aquilæ	4.7	F0	18 38	3.536	s	+3.2865	+0.0020	- 9 7	38.89		+3.308	-0.006
φ Sagittarii	3.3	B8	18 40	50.755	s	3.7481	+0.0034	-27 4	16.61		3.547	-0.006
110 Herculis	4.3	F5	18 42	20.803	s	2.5805	-.0019	+20 28	17.49		3.339	-0.344
6 Aquilæ	4.5	G0	18 43	5.328	s	3.1828	-.0009	- 4 49	53.31		3.723	-0.023
λ Pavonis	4.4	B2	18 45	5.174	s	5.5637	-.0030	-62 16	39.81		3.896	-0.022
β Lyræ †	var.	B2p	18 47	14.207	s	+2.2118	+0.0001	+33 16	20.63		+4.097	-0.003
50 Draconis	5.4	A0	18 48	52.048	s	-1.9213	-.0032	+75 20	36.92		4.293	+0.051
ο Draconis †	4.8	K0	18 50	4.058	s	+0.8878	+0.0116	+59 17	37.93		4.368	+0.023
σ Sagittarii	2.1	B3	18 50	29.433	s	3.7196	-.0003	-26 23	37.92		4.306	-0.075
θ Serpentis pr. †	4.5	A5	18 52	23.475	s	2.9821	+0.0027	+ 4 6	8.11		4.570	+0.028
R Lyræ †	var.	Mb	18 52	59.544	s	+1.8260	+0.0026	+43 50	38.18		+4.672	+0.078
γ Lyræ	3.3	A0	18 56	3.759	s	2.2436	-.0006	+32 34	58.78		4.819	-0.006
ε Aquilæ	4.2	K0	18 56	7.634	s	2.7221	-.0042	+14 57	45.34		4.779	-0.081
ζ Sagittarii †	2.7	A2	18 57	42.789	s	3.8173	-.0024	-29 59	30.50		4.975	-0.019
ξ Aquilæ	3.0	A0	19 1	52.239	s	2.7569	-.0008	+13 44	52.54		5.247	-0.099
λ Aquilæ	3.6	A0	19 2	9.751	s	+3.1834	-.0020	- 4 59	56.56		+5.288	-0.083
α Coronæ Australis	4.1	A2	19 4	14.053	s	4.0822	+0.0051	-38 1	33.88		5.127	-0.118
ι Lyræ	5.1	B5	19 4	33.268	s	2.1413	+0.0005	+35 58	42.91		5.565	-0.006
π Sagittarii	3.0	F2	19 5	11.124	s	3.5684	-.0005	-21 8	50.17		5.589	-0.036
ψ Sagittarii	4.9	F5	19 10	49.207	s	3.6795	+0.0025	-25 23	26.68		6.061	-0.035
δ Draconis	3.2	K0	19 12	32.541	s	+0.0204	+0.0175	+67 31	33.81		+6.327	+0.088
d Sagittarii	5.0	K0	19 13	7.822	s	+3.5104	-.0015	-19 5	28.33		+6.271	-0.017

ψ Draconis, star 6^m.1, 30".4 n. f.
70 Ophiuchi, comp. 6^m, 5".9 s. f.

β Lyræ, var., 12^d.9, 3^m.4-4^m.1, star
7^m, 46" s. f.
ο Draco, star 7^m.6, 32".1 n. pr.

θ Serpentis, star 5^m.4, 22".2 s. f.
R Lyræ, var., 46^d.4, 4^m.0-4^m.7
ξ Sag., binary, 3^m.4, 3^m.6, 0".5

228 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
θ Lyræ	4.5	K0	19 13 41.673	+2.0809	-.0015	+37 59 45.18	+ 6.341	+0.006
ω Aquilæ	5.1	A5	19 14 12.131	2.8158	-.0002	+11 27 19.77	6.391	+0.014
κ Cygni	4.0	K0	19 15 19.456	+1.3876	+0.0071	+53 13 33.02	6.592	+0.122
τ Draconis	4.6	K0	19 17 2.706	-1.1403	-.0312	+73 12 46.72	6.721	+0.109
δ Aquilæ	3.4	F0	19 21 36.968	+3.0248	+0.0168	+ 2 57 36.56	7.070	+0.082
β Cygni	3.2	K0p	19 27 36.940	+2.4190	-.0002	+27 47 49.15	+ 7.468	-0.010
ι Cygni	3.9	A2	19 27 45.915	1.5131	+0.0023	+51 33 54.59	7.619	+0.129
μ Aquilæ	4.6	K0	19 30 19.700	2.9311	+0.0145	+ 7 12 52.34	7.551	-0.146
h Sagittarii	4.7	B9	19 32 1.374	3.6522	+0.0015	-25 3 17.41	7.807	-0.027
κ Aquilæ	5.0	B0	19 32 45.009	3.2285	+0.0005	- 7 11 58.85	7.894	+0.002
θ Cygni	4.6	F5	19 34 22.616	+1.6088	-.0024	+50 2 31.66	+ 8.274	+0.250
54 Sagittarii	5.4	K0	19 36 18.797	3.1381	+0.0016	-16 28 15.61	8.131	-0.047
β Sagittæ	4.4	K0	19 37 35.407	2.6939	+0.0001	+17 17 48.10	8.218	-0.032
15 Cygni	5.0	K0	19 41 30.018	2.1641	+0.0068	+37 10 3.74	8.631	+0.041
f Sagittarii	5.1	K0	19 41 52.301	3.5007	-.0099	-19 56 50.45	8.531	-0.088
δ Cygni	3.0	A0	19 42 34.153	+1.8760	+0.0055	+44 56 31.50	+ 8.719	+0.044
γ Aquilæ	2.8	K2	19 42 35.929	2.8519	+0.0007	+10 25 28.46	8.674	-0.093
δ Sagittæ	3.8	Map	19 43 57.264	2.6719	+0.0004	+18 20 36.36	8.801	+0.017
α Aquilæ (<i>Altair</i>)	0.9	A5	19 47 1.586	+2.9270	+0.0360	+ 8 39 49.94	9.403	+0.379
ε Draconis	4.0	K0	19 48 26.611	-0.1912	+0.0170	+70 4 18.38	9.162	+0.027
η Aquilæ	var.	G0	19 48 33.059	+3.0565	+0.0005	+ 0 48 25.08	+ 9.135	-0.008
ι Sagittarii	4.2	K0	19 49 57.063	4.1112	-.0017	-42 4 19.01	9.297	+0.045
β Aquilæ	3.9	K0	19 51 31.855	2.9167	+0.0025	+ 6 12 48.38	8.894	-0.481
ε Pavonis	4.1	A0	19 51 42.581	6.9740	+0.0112	-73 6 56.22	9.268	-0.120
γ Sagittæ	3.7	K5	19 55 19.935	2.6673	+0.0011	+19 16 55.54	9.692	+0.025
c Sagittarii	4.6	Mb	19 57 55.559	+3.6917	+0.0023	-27 55 30.46	+ 9.878	+0.013
τ Aquilæ	5.6	K0	20 0 22.720	2.9306	+0.0010	+ 7 3 35.78	10.080	+0.029
θ Aquilæ	3.4	A0	20 7 19.946	3.0456	+0.0020	- 1 3 3.08	10.578	+0.006
ο Cygni seq.	4.0	K0p	20 11 12.473	+1.8902	+0.0014	+46 30 25.86	10.864	+0.005
κ Cephei	4.4	B9	20 11 30.688	-1.9788	+0.0021	+77 28 48.67	10.907	+0.026
24 Vulpeculæ	5.4	K0	20 13 29.413	+2.5674	+0.0017	+24 25 59.04	+11.014	-0.012
α ² Capricorni	3.8	K0	20 13 47.026	3.3298	+0.0010	-12 47 4.28	11.056	+0.008
β Capricorni	3.2	G0p	20 16 41.237	3.3726	+0.0030	-15 1 31.97	11.265	+0.007
γ Cygni	2.3	F8p	20 19 27.864	2.1528	+0.0001	+40 0 34.18	11.460	+0.001
α Pavonis	2.1	B3	20 19 33.906	4.7595	.0000	-56 58 59.72	11.374	-0.092
π Capricorni	5.2	B8	20 22 54.928	+3.4351	+0.0004	-18 27 54.14	+11.703	-0.002
ρ Capricorni	5.0	F0	20 24 28.234	3.4237	-.0013	-18 4 9.31	11.795	-0.020
41 Cygni	4.1	F5	20 26 15.008	2.4517	+0.0014	+30 6 39.07	11.933	-0.002
θ Cephei	4.3	A5	20 28 17.582	1.0105	+0.0066	+62 44 5.62	12.066	-0.018
ε Delphini	4.0	B5	20 29 32.075	+2.8663	+0.0007	+11 2 26.21	12.145	-0.025
Groombridge 3241	6.4	K2	20 30 21.070	-0.2442	-.0017	+72 16 15.25	+12.208	-0.018
α Indi	3.2	K0	20 32 9.326	+1.2265	+0.0027	-47 33 40.90	12.405	+0.053
β Delphini	3.7	F5	20 33 56.336	2.8138	+0.0082	+14 19 35.02	12.439	-0.035
ν Capricorni	5.3	Ma	20 35 40.110	3.4171	-.0018	-18 24 38.01	12.585	-0.007
α Delphini	3.9	B8	20 36 3.709	2.7868	+0.0017	+15 38 23.37	12.636	+0.017
β Pavonis	3.6	A5	20 38 2.305	+5.4339	-.0079	-66 28 53.51	+12.750	-0.003
α Cygni (<i>Deneb</i>)	1.3	A2p	20 38 48.388	2.0440	+0.0001	+45 0 16.16	12.802	-0.002
δ Delphini	4.5	A2	20 39 51.849	2.8008	-.0014	+14 47 50.49	12.826	-0.050
ψ Capricorni	4.3	F8	20 41 32.386	3.5553	-.0010	-25 32 54.22	12.810	-0.148
γ Delphini seq.	4.5	G5	20 43 5.146	2.7832	-.0023	+15 50 45.50	12.894	-0.196
ε Cygni	2.6	K0	20 43 5.735	+2.4277	+0.0294	+33 40 51.94	+13.417	+0.327
α Aquarii	3.8	A0	20 43 30.547	3.2486	+0.0017	- 9 46 42.70	13.088	-0.030
η Cephei	3.6	K0	20 43 43.569	1.2234	+0.0131	+61 32 21.72	13.953	+0.820
μ Aquarii	4.8	A3	20 48 30.130	3.2371	+0.0025	- 9 16 23.80	13.407	-0.039
β Indi	3.7	K0	20 48 48.224	+4.7056	+0.0018	-58 44 44.33	13.457	-0.008
220 H ¹ . Draconis	5.6	K0	20 51 7.854	-2.6541	-.0106	+80 15 51.93	+13.589	-0.025

β Cygni, star 5^m.4, 34".7 n. f.
δ Cygni, comp. 8^m, 1".6 n. pr.
ε Draconis, comp. 7^m.6, 3".1 n.
ν Aquilæ, var., 7^d.18, 3^m.7-4^m.4

ο Cygni, star 5^m.0 pr. 19°, 270" n.,
star 7^m.8 f. 1°, 96" s.
κ Cephei, comp. 8^m, 7".5 s. f.
α² Capricor., α¹ Capricor., 4^m.6 pr. 24°,
137" n.

β Capricor., star 6^m.2 pr. 14°, 10" s.
π Capricor., comp. 9^m, 3".4 s. f.
ρ Capricor., comp. 7^m.6, 2".8 s.
β Delphini, binary, 4^m.1, 5^m.4, 0".5
γ Delphini, comp. 5^m.5, 11".2 pr.

MEAN PLACES OF TEN-DAY STARS, 1923. 229

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
32 Vulpeculæ . . .	5.2	K2	20 51 16.676	+2.5565	-.0003	+27 45 50.64	+13.629	+0.004
ν Cygni . . .	4.0	A0	20 54 18.104	2.2359	+.0008	+40 52 11.93	13.799	-0.018
α Octantis . . .	5.2	F2	20 55 26.607	7.3546	-.0004	-77 19 10.59	13.500	-0.389
γ Microscopii . . .	4.7	G5	20 56 34.372	3.6847	-.0004	-32 33 34.89	13.956	-0.004
θ Capricorni . . .	4.2	A0	21 1 37.250	3.3744	+.0051	-17 32 23.36	14.207	-0.066
ξ Cygni . . .	3.9	K5	21 2 7.763	+2.1816	+.0009	+43 37 12.51	+14.313	+0.008
61 Cygni <i>pr.</i> . . .	5.6	K5	21 3 26.578	2.6856	+.3496	+38 22 11.89	17.636	+3.251
61 Cygni <i>seq.</i> . . .	6.3	K5	Δα + 1.484	....	Δδ -16.62	....	....	....
ν Aquarii . . .	4.5	K0	21 5 24.064	+3.2692	+.0057	-11 41 3.09	14.498	-0.006
Bradley 2777 . . .	5.9	A	21 7 4.298	-1.1558	+.0102	+77 48 51.94	14.634	+0.030
3 Piscis Australis . . .	5.6	K5	21 8 43.582	+3.5618	+.0075	-27 56 3.33	+14.597	-0.106
ζ Cygni . . .	3.4	K0	21 9 39.489	2.5524	-.0002	+29 54 37.17	14.697	-0.061
τ Cygni . . .	3.8	F0	21 11 43.001	2.3944	+.0141	+37 42 57.95	15.313	+0.434
α Equulei . . .	4.1	F8p	21 11 58.500	2.9900	+.0031	+ 4 55 43.41	14.809	-0.085
σ Cygni . . .	4.3	A0p	21 14 23.431	2.3552	-.0001	+39 4 17.31	15.038	+0.003
θ ¹ Microscopii . . .	4.9	A2p	21 15 50.346	+3.8419	+.0028	-41 8 9.36	+15.124	+0.005
α Cephei . . .	2.6	A5	21 16 44.630	1.4314	+.0221	+62 15 32.23	15.220	+0.050
ι Capricorni . . .	4.3	K0	21 17 57.712	3.3131	+.0022	-17 9 47.91	15.244	+0.004
1 Pegasi . . .	4.2	K0	21 18 31.509	2.7742	+.0075	+19 28 27.67	15.336	+0.064
γ Pavonis . . .	4.3	F8	21 20 5.838	4.9909	+.0153	-65 42 57.47	18.145	+0.784
ζ Capricorni . . .	3.9	G5p	21 22 16.470	+3.4290	+.0004	-22 44 44.44	+15.502	+0.020
g Cygni . . .	5.3	K0	21 26 36.419	2.2132	+.0050	+46 12 2.04	15.825	+0.105
β Aquarii . . .	3.1	G0	21 27 30.400	3.1593	+.0012	- 5 54 38.61	15.758	-0.011
β Cephei . . .	3.3	B1	21 27 40.438	0.7832	+.0026	+70 13 20.91	15.783	+0.005
ξ Aquarii . . .	4.8	A5	21 33 39.261	3.1950	+.0075	- 8 12 0.90	16.072	-0.023
74 Cygni . . .	5.1	A5	21 33 51.713	+2.1039	+.0003	+40 4 1.16	+16.115	+0.009
γ Capricorni . . .	3.8	F0p	21 35 49.636	3.3262	+.0129	-17 0 38.80	16.190	-0.017
ε Pegasi . . .	2.5	K0	21 40 24.230	2.9161	+.0016	+ 9 31 16.58	16.440	0.000
11 Cephei . . .	4.8	K0	21 40 47.934	0.8854	+.0221	+70 57 23.81	16.553	+0.093
δ Capricorni . . .	3.0	A5	21 42 47.579	3.3131	+.0176	-16 28 38.74	16.261	-0.297
π ² Cygni . . .	4.3	B3	21 43 56.829	+2.2152	+.0009	+48 57 10.09	+16.614	-0.001
μ Capricorni . . .	5.2	F0	21 49 5.976	3.2721	+.0201	-13 54 54.28	16.864	+0.001
γ Gruis . . .	3.2	B8	21 49 16.252	3.6387	+.0077	-37 43 40.13	16.851	-0.021
16 Pegasi . . .	5.0	B3	21 49 33.454	2.7288	+.0005	+25 33 44.52	16.891	+0.006
79 Draconis . . .	6.6	A0	21 51 53.545	0.7150	+.0101	+73 20 16.04	17.010	+0.016
20 Pegasi . . .	5.7	F2	21 57 20.249	+2.9223	+.0038	+12 45 1.63	+17.188	-0.054
ε Indi . . .	4.7	K5	21 57 28.739	4.6036	+.4783	-57 6 11.60	14.678	-2.570
α Aquarii . . .	3.2	G0	22 1 49.786	3.0817	+.0010	- 0 41 40.03	17.437	-0.002
ι Aquarii . . .	4.4	B8	22 2 16.814	3.2116	+.0022	-14 14 38.06	17.396	-0.062
20 Cephei . . .	5.4	K5	22 2 40.059	1.8232	+.0032	+62 24 34.32	17.526	+0.051
α Gruis . . .	2.2	B5	22 3 23.225	+3.7901	+.0110	-47 20 5.49	+17.331	-0.174
ι Pegasi . . .	4.0	F5	22 3 25.528	2.7920	+.0222	+24 58 6.33	17.528	+0.021
θ Pegasi . . .	3.7	A0	22 6 18.965	3.0266	+.0187	+ 5 49 6.79	17.665	+0.036
π Pegasi . . .	4.4	F5	22 6 33.975	2.6634	-.0003	+32 47 59.55	17.621	-0.018
ζ Cephei . . .	3.6	K0	22 8 10.837	2.0790	+.0018	+57 49 16.93	17.716	+0.010
24 Cephei . . .	5.0	G5	22 8 19.825	+1.1559	+.0014	+71 57 41.90	+17.716	+0.004
θ Aquarii . . .	4.3	K0	22 12 46.296	3.1666	+.0074	- 8 10 1.93	17.872	-0.018
α Tucanæ . . .	2.9	K2	22 13 14.279	4.1281	-.0118	-60 38 37.85	17.874	-0.035
γ Aquarii . . .	4.0	A0	22 17 40.779	3.0988	+.0081	- 1 46 32.68	18.095	+0.015
31 Pegasi . . .	4.9	B3p	22 17 43.679	2.9531	+.0010	+11 49 0.01	18.089	+0.007
3 Lacertæ . . .	4.6	K0	22 20 31.774	+2.3568	-.0007	+51 50 34.33	+17.998	-0.188
π Aquarii . . .	4.6	B1	22 21 20.673	3.0636	+.0004	+ 0 59 9.96	18.215	-0.001
σ Aquarii . . .	4.9	A0	22 26 34.450	3.1764	.0000	-11 4 20.64	18.377	-0.026
α Lacertæ . . .	3.8	A0	22 28 7.013	2.4694	+.0157	+49 53 10.22	18.469	+0.014
ν Aquarii . . .	5.3	F5	22 30 29.006	3.2839	+.0148	-21 6 11.84	18.381	-0.164
226 B. Cephei . . .	5.7	A0	22 30 55.610	+1.0620	-.0052	+75 49 46.30	+18.550	0.000

τ Cygni, comp. 7^m, 0^s.8

| g Cygni, star 6^m.7 f. 10^s, 420^s. s.

| β Cephei, star 8^m, 13^s.3 s. pr.

230 MEAN PLACES OF TEN-DAY STARS, 1923.

FOR JANUARY 0^d.670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Vari- ation.	Annual P. M.	Declination.	Annual Vari- ation.	Annual P. M.
			h m s	s	s	° ' "	"	"
η Aquarii	4.1	B8	22 31 24.002	+3.0830	+0.0057	- 0 30 53.25	+18.513	-0.053
10 Lacertæ	4.9	Oe5	22 35 48.241	2.6901	+0.0011	+38 38 56.60	18.696	-0.011
ε Piscis Australis	4.2	B8	22 36 23.977	3.3212	+0.0008	-27 26 45.24	18.715	-0.011
ζ Pegasi	3.6	B8	22 37 37.275	2.9916	+0.0054	+10 25 44.14	18.750	-0.014
β Gruis	2.2	Mb	22 38 4.603	3.5925	+0.0133	-47 17 16.49	18.752	-0.026
η Pegasi	3.1	G0	22 39 23.424	+2.8101	+0.0011	+29 49 4.71	+18.780	-0.037
λ Pegasi	4.1	K0	22 42 49.207	2.8876	+0.0037	+23 9 36.21	18.910	-0.009
ε Gruis	3.7	A2	22 43 54.648	3.6340	+0.0093	-51 43 19.45	18.892	-0.059
τ Aquarii	4.2	K5	22 45 31.029	3.1784	-0.0008	-13 59 57.67	18.963	-0.033
μ Pegasi	3.7	K0	22 46 17.111	2.8940	+0.0110	+24 11 40.66	18.975	-0.042
ι Cephei	3.7	K0	22 46 56.084	+2.1299	- 0.111	+65 47 42.42	+18.909	-0.126
λ Aquarii	3.8	Ma	22 48 35.896	3.1304	+0.0002	- 7 59 23.03	19.115	+0.035
ρ Indi	6.1	G5	22 49 19.200	4.2040	- 0.0133	-70 29 8.14	19.153	+0.053
δ Aquarii	3.5	A2	22 50 33.921	3.1854	-0.0034	-16 13 50.49	19.106	-0.026
α Pisc. Aust. (<i>Fomalhaut</i>)	1.3	A3	22 53 23.969	3.3193	+0.0252	-30 1 50.80	19.033	0.171
ο Andromedæ	3.6	B5p	22 58 22.449	+2.7561	+0.0020	+41 54 42.57	+19.315	-0.010
β Pegasi	†	var.	Ma 23 0 2.343	2.9062	+0.0146	+27 39 53.20	19.498	+0.135
α Pegasi (<i>Markab</i>)	2.6	A0	23 0 55.423	2.9868	+0.0040	+14 47 26.45	19.343	-0.039
55 Pegasi	4.7	Ma	23 3 7.469	3.0211	+0.0003	+ 8 59 35.46	19.418	-0.012
ε² Aquarii	3.8	K0	23 5 20.584	3.2009	+0.0032	-21 35 26.55	19.519	+0.041
π Cephei	†	4.6	G5 23 5 26.638	+1.9014	+0.0023	+74 58 15.74	+19.447	-0.032
ι Gruis	4.1	K0	23 6 0.354	3.4041	+0.0121	-45 39 50.95	19.460	-0.031
59 Pegasi	5.2	A3	23 7 50.888	3.0281	-0.0007	+ 8 18 6.35	19.533	+0.004
5 H¹ Cassiopeiae	5.6	K2	23 9 34.180	2.8818	+0.2538	+56 44 35.13	19.860	+0.299
φ Aquarii	4.4	Ma	23 10 20.091	3.1068	+0.0015	- 6 27 51.79	19.382	-0.194
ψ Aquarii	†	4.5	K0 23 11 51.534	+3.1444	+0.0250	- 9 30 26.41	+19.599	-0.005
γ Tucanæ	4.1	F2	23 12 56.650	3.5115	-0.0057	-58 39 30.68	19.684	+0.060
γ Piscium	3.8	K0	23 13 10.387	3.1094	+0.0502	+ 2 51 40.82	19.649	+0.021
γ Sculptoris	4.5	K0	23 14 40.147	3.2431	+0.0002	-32 57 6.37	19.588	-0.066
ο Cephei	†	4.9	G5 23 15 27.393	2.4551	+0.0113	+67 41 24.17	19.685	+0.018
τ Pegasi	4.6	A5	23 16 49.383	+2.9667	+0.0018	+23 19 6.92	+19.678	-0.012
δ¹ Aquarii	4.2	K0	23 18 55.676	3.1521	-0.0099	-20 31 16.27	19.634	-0.089
4 Cassiopeiae	5.2	K5	23 21 24.507	2.6536	- 0.0004	+61 51 35.69	19.752	-0.010
υ Pegasi	4.6	G0	23 21 32.014	2.9915	+0.0134	+22 58 47.68	19.794	+0.030
κ Piscium	4.9	A2p	23 22 59.110	3.0752	+0.0056	+ 0 50 2.20	19.692	-0.093
θ Piscium	4.4	G5	23 24 3.671	+3.0422	-0.0088	+ 5 57 21.28	+19.758	-0.041
70 Pegasi	4.7	K0	23 25 15.533	3.0326	+0.0040	+12 20 8.19	19.850	+0.035
β Sculptoris	4.5	B9	23 28 50.796	3.2226	+0.0071	-38 14 40.22	19.866	+0.006
72 Pegasi (<i>meani</i>)	†	5.2	K2 23 30 7.759	2.9723	+0.0035	+30 54 1.04	19.865	-0.009
λ Andromedæ	4.0	K0	23 33 47.406	2.9304	+0.0158	+46 2 27.17	19.494	-0.420
ι Andromedæ	4.3	B8	23 34 21.284	+2.9369	+0.0025	+42 50 30.07	+19.919	0.000
ι Piscium	4.3	G0	23 35 59.332	3.0846	+0.0246	+ 5 12 31.76	19.499	-0.436
γ Cephei	3.4	K0	23 36 10.514	2.4449	-0.0173	+77 12 9.38	20.094	+0.157
κ Andromedæ	4.3	A0	23 36 36.626	2.9496	+0.0078	+43 54 26.63	19.916	-0.024
ω² Aquarii	4.6	A0	23 38 43.818	3.1122	+0.0063	-14 58 14.39	19.896	-0.063
ϑ Aquarii	5.3	B8	23 40 12.580	+3.1137	+0.0019	-18 42 16.14	+19.965	-0.006
ψ Andromedæ	5.1	K0	23 42 12.758	2.9660	+0.0005	+45 59 33.45	19.977	-0.008
41 H. Cephei	5.0	A0	23 44 13.087	2.8545	+0.0024	+67 22 43.81	19.988	-0.010
δ Sculptoris	4.6	A0	23 44 55.002	3.1265	+0.0059	-28 33 23.67	19.868	-0.133
φ Pegasi	5.2	Ma	23 48 34.072	3.0489	-0.0013	+18 41 33.28	19.981	-0.039
ρ Cassiopeiae	4.8	F8p	23 50 31.615	+2.9853	-0.0023	+57 4 15.66	+20.029	+0.002
Groombridge 4163	6.6	B9	23 51 3.771	2.8873	-0.0040	+73 58 54.37	20.025	-0.005
ω Piscium	4.0	F5	23 55 21.376	3.0799	+0.0102	+ 6 26 13.52	19.933	-0.108
ε Tucanæ	4.7	B9	23 55 55.556	3.1337	+0.0076	-66 0 18.82	20.035	-0.007
30 Piscium	4.7	Mb	23 58 0.676	3.0770	+0.0030	- 6 26 31.16	20.007	-0.037
2 Ceti	4.6	A0	23 59 47.788	+3.0746	+0.0015	-17 45 53.03	+20.032	-0.013

β Pegasi, var. irreg., 2^m.2-2^m.7
 π Cephei, comp. 7^m, 0^s.9 f.

ψ Aquarii, star 8^m.5, 49^s.4 n. pr.
 ο Cephei, comp. 8^m, 2^s.9 s. pr.

72 Pegasi, binary, 6^m.0, 6^m.0, 0^s.4

MEAN PLACES OF CIRCUMPOLAR STARS, 1923. 231

FOR JANUARY 0^h670, WASHINGTON MEAN TIME.

Name of Star.	Magni- tude.	Spec- trum.	Right Ascension.	Annual Varia- tion.	Annual P. M.	Declination.	Annual Varia- tion.	Annual P. M.
			^h ^m ^s	^s	^s	[°] ['] ["]	["]	["]
43 H. Cephei	4.5	K0	0 57 55.489	+ 7.7462	+ .0735	+85 50 41.77	+19.404	-0.004
α Ursæ Min. (<i>Polaris</i>) . †	2.1	F8	1 33 11.898	+30.5750	+ .1514	+88 53 34.33	+18.412	+0.001
4 G. Octantis	5.6	K0	1 41 39.995	- 3.6908	+ .0086	-85 9 32.70	+18.132	+0.028
Groombridge 750	6.7	F8	4 11 48.583	+17.7236	+ .0131	+85 21 5.69	+ 9.157	+0.042
Groombridge 944	6.4	K0	5 37 5.478	+18.7948	+ .0130	+85 9 42.71	+ 1.996	-0.004
31 G. Mensæ	6.2	A0	5 45 4.700	-11.6700	- .0119	-84 49 38.84	+ 1.391	+0.087
ζ Mensæ	5.6	A2	6 46 28.850	- 4.9537	- .0035	-80 44 2.02	- 3.955	+0.082
51 H. Cephei	5.3	Ma	7 4 58.549	+28.9932	- .0581	+87 10 21.62	- 5.642	-0.034
7 G. Octantis	6.4	F5	7 14 18.185	-20.4268	- .0145	-86 54 45.50	- 6.340	+0.006
25 H. Camelopardalis	5.1	Mb	7 14 59.083	+12.7819	+ .0131	+82 33 51.51	- 6.489	-0.047
Groombridge 1119	7.0	A0	8 21 41.998	+57.9704	- .0383	+88 51 51.95	-11.601	+0.018
ζ Octantis	5.4	A3	9 8 8.703	- 8.2569	- .1152	-85 21 25.35	-14.625	+0.044
1 H. Draconis	4.6	K0	9 26 14.295	+ 8.7400	- .0059	+81 40 7.28	-15.727	-0.027
ζ Chamaeleontis	5.2	B3	9 36 12.346	- 1.6759	- .0121	-80 35 44.11	-16.209	+0.019
30 H. Camelopardalis	5.3	F5	10 21 50.081	+ 7.5157	- .0460	+82 57 4.81	-18.225	+0.009
η Octantis	6.3	A0	10 59 53.036	- 0.3843	- .0577	-84 10 46.79	-19.364	-0.005
Bradley 1672	6.3	F0	12 14 30.802	+ 0.1165	- .0705	+88 7 36.40	-19.946	+0.058
ι Octantis	5.4	K0	12 46 43.161	+ 6.0288	+ .0368	-84 42 20.01	-19.606	+0.024
32 H. Camelop. seq. . . . †	5.3	A2	12 48 33.111	+ 0.4547	- .0183	+83 49 52.08	-19.581	+0.016
κ Octantis	5.6	A2	13 28 9.628	+ 9.2187	- .0768	-85 23 33.94	-18.604	-0.024
δ Octantis	4.1	K2	14 14 23.592	+ 9.3326	- .0513	-83 19 1.42	- 16.710	-0.014
Groombridge 2283	7.2	K0	15 1 45.970	-19.0047	- .0070	+87 31 46.68	-14.034	+0.031
ρ Octantis	5.7	A2	15 25 17.036	+13.4498	+ .0813	-84 12 45.34	-12.446	+0.081
ε Ursæ Minoris	4.4	G5	16 53 48.037	- 6.2321	+ .0057	+82 9 58.64	- 5.710	-0.001
59 G. Apodis	5.9	Mb	17 17 1.936	+11.1801	+ .0087	-80 47 29.50	- 3.775	-0.039
δ Ursæ Minoris	4.4	A0	17 57 4.326	-19.4946	+ .0170	+86 36 50.43	- 0.208	+0.048
χ Octantis	5.2	K0	18 9 46.186	+35.6998	- .0937	-87 39 48.39	+ 0.727	-0.127
λ Ursæ Minoris	6.6	Mb	18 55 23.393	-73.3103	- .1120	+89 1 32.83	+ 4.803	+0.005
σ Octantis	5.5	F0	19 37 1.735	+91.7037	+ .1068	-89 12 41.41	+ 8.236	0.000
76 Draconis	5.7	A0	20 48 15.385	- 4.2013	+ .0131	+82 14 50.67	+13.455	+0.025
λ Octantis †	5.4	G0p	21 39 16.433	+ 9.4506	+ .0387	-83 4 28.91	+16.371	-0.012
ν Octantis	5.7	K0	22 17 21.969	+12.1303	- .0400	-86 21 38.42	+18.143	+0.074
β Octantis	4.3	F0	22 38 16.769	+ 6.2711	- .0301	-81 47 9.68	+18.786	+0.002
39 H. Cephei	5.6	F0	23 27 42.388	- 0.3089	+ .0615	+86 52 58.09	+19.866	+0.020
γ ¹ Octantis	5.1	G5	23 47 38.028	+ 3.5917	- .0246	-82 26 48.40	+20.004	-0.012

α Ursæ Min., star 9^m, 18^s s. pr. | 32 H. Camelop., star 5^m.8, 21^s.6 n. pr. | λ Octantis, binary, 5^m.5, 8^m.0, 3^s.2 n.f

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m 0 57	° ' " +85 50	Jan.	h m 1 33	° ' " +38 53	Jan.	h m 1 41	° ' " -85 9	Jan.	h m 4 11	° ' " +85 21	Jan.	h m 5 37	° ' " +85 9
0.3	s 65.89	" 58.90	0.3	s 60.05	" 49.59	0.3	s 37.72	" 57.09	0.4	s 65.33	" 8.47	0.5	s 21.31	" 37.89
1.3	65.63	58.99	1.3	59.08	49.75	1.3	37.44	57.09	1.4	65.25	8.76	1.5	21.32	38.20
2.3	65.35	59.09	2.3	58.06	49.90	2.3	37.17	57.09	2.4	65.16	9.08	2.5	21.33	38.52
3.3	65.06	59.18	3.3	56.99	50.06	3.3	36.91	57.08	3.4	65.05	9.40	3.4	21.34	38.86
4.3	64.75	59.28	4.3	55.86	50.22	4.3	36.67	57.06	4.4	64.93	9.71	4.4	21.33	39.22
5.3	64.43	59.35	5.3	54.66	50.35	5.3	36.42	57.05	5.4	64.80	10.00	5.4	21.30	39.57
6.2	64.09	59.40	6.3	53.45	50.46	6.3	36.19	57.04	6.4	64.63	10.30	6.4	21.25	39.91
7.2	63.77	59.42	7.3	52.24	50.55	7.3	35.95	57.04	7.4	64.46	10.58	7.4	21.17	40.24
8.2	63.45	59.42	8.3	51.07	50.60	8.3	35.68	57.05	8.4	64.29	10.82	8.4	21.09	40.54
9.2	63.17	59.41	9.3	49.97	50.65	9.3	35.41	57.06	9.4	64.12	11.05	9.4	21.00	40.83
10.2	62.88	59.41	10.3	48.92	50.70	10.3	35.13	57.07	10.4	63.97	11.27	10.4	20.92	41.11
11.2	62.62	59.40	11.3	47.93	50.75	11.3	34.84	57.06	11.4	63.82	11.49	11.4	20.86	41.39
12.2	62.36	59.40	12.3	46.94	50.80	12.3	34.54	57.03	12.4	63.68	11.72	12.4	20.81	41.66
13.2	62.10	59.41	13.3	45.94	50.88	13.3	34.25	56.98	13.4	63.54	11.95	13.4	20.76	41.94
14.2	61.83	59.44	14.3	44.89	50.96	14.3	33.96	56.90	14.4	63.41	12.19	14.4	20.71	42.23
15.2	61.54	59.46	15.2	43.79	51.02	15.3	33.68	56.82	15.4	63.27	12.46	15.4	20.66	42.55
16.2	61.23	59.47	16.2	42.64	51.09	16.2	33.44	56.72	16.4	63.09	12.72	16.4	20.58	42.86
17.2	60.91	59.46	17.2	41.44	51.15	17.2	33.19	56.62	17.3	62.91	12.97	17.4	20.50	43.18
18.2	60.60	59.43	18.2	40.21	51.20	18.2	32.95	56.54	18.3	62.71	13.22	18.4	20.40	43.50
19.2	60.28	59.38	19.2	38.97	51.21	19.2	32.70	56.46	19.3	62.49	13.46	19.4	20.27	43.81
20.2	59.95	59.32	20.2	37.74	51.20	20.2	32.46	56.38	20.3	62.27	13.66	20.4	20.14	44.10
21.2	59.64	59.24	21.2	36.54	51.19	21.2	32.20	56.32	21.3	62.04	13.86	21.4	20.00	44.39
22.2	59.35	59.15	22.2	35.36	51.15	22.2	31.94	56.25	22.3	61.81	14.04	22.4	19.85	44.66
23.2	59.06	59.05	23.2	34.22	51.10	23.2	31.67	56.17	23.3	61.59	14.21	23.4	19.70	44.90
24.2	58.77	58.95	24.2	33.11	51.06	24.2	31.40	56.09	24.3	61.37	14.36	24.4	19.55	45.15
25.2	58.50	58.84	25.2	32.04	51.02	25.2	31.12	56.01	25.3	61.17	14.51	25.4	19.41	45.39
26.2	58.23	58.75	26.2	31.01	50.97	26.2	30.84	55.89	26.3	60.96	14.67	26.4	19.27	45.62
27.2	57.99	58.67	27.2	29.98	50.92	27.2	30.56	55.76	27.3	60.77	14.82	27.4	19.15	45.86
28.2	57.74	58.58	28.2	28.95	50.89	28.2	30.28	55.62	28.3	60.58	14.99	28.4	19.02	46.10
29.2	57.47	58.50	29.2	27.89	50.88	29.2	30.01	55.45	29.3	60.39	15.16	29.4	18.90	46.35
30.2	57.19	58.42	30.2	26.79	50.87	30.2	29.77	55.28	30.3	60.18	15.34	30.4	18.78	46.62
31.2	56.90	58.35	31.2	25.65	50.83	31.2	29.52	55.10	31.3	59.96	15.52	31.4	18.64	46.90
13.82	+13.78		51.97	+51.96		11.87	-11.82		12.34	+12.30		11.86	+11.81	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	5 45	-84 49	Jan.	6 46	-80 44	Jan.	7 5	+87 10	Jan.	7 14	-86 54	Jan.	7 15	+82 33
	s	"		s	"		s	"		s	"		s	"
0.5	19.32	53.30	0.5	38.26	10.84	0.5	21.34	9.67	0.5	47.61	51.31	0.5	7.46	38.75
1.5	19.20	53.63	1.5	38.25	11.22	1.5	21.53	9.96	1.5	47.57	51.69	1.5	7.55	39.02
2.5	19.07	53.95	2.5	38.21	11.59	2.5	21.70	10.27	2.5	47.51	52.06	2.5	7.63	39.31
3.5	18.94	54.24	3.5	38.18	11.92	3.5	21.87	10.59	3.5	47.44	52.40	3.5	7.71	39.63
4.4	18.82	54.52	4.5	38.15	12.24	4.5	22.02	10.94	4.5	47.37	52.73	4.5	7.78	39.95
5.4	18.71	54.79	5.5	38.11	12.56	5.5	22.13	11.28	5.5	47.30	53.05	5.5	7.84	40.29
6.4	18.60	55.07	6.5	38.08	12.88	6.5	22.23	11.63	6.5	47.24	53.37	6.5	7.89	40.62
7.4	18.48	55.36	7.5	38.06	13.21	7.5	22.29	11.98	7.5	47.18	53.69	7.5	7.93	40.96
8.4	18.37	55.67	8.5	38.03	13.55	8.5	22.33	12.31	8.5	47.14	54.02	8.5	7.94	41.29
9.4	18.24	55.98	9.5	38.00	13.92	9.5	22.34	12.63	9.5	47.10	54.38	9.5	7.96	41.58
10.4	18.11	56.31	10.5	37.96	14.29	10.5	22.37	12.93	10.5	47.04	54.75	10.5	7.98	41.87
11.4	17.97	56.64	11.5	37.92	14.67	11.5	22.41	13.22	11.5	46.96	55.13	11.5	8.01	42.15
12.4	17.80	56.96	12.5	37.88	15.05	12.5	22.46	13.51	12.5	46.86	55.52	12.5	8.05	42.42
13.4	17.63	57.27	13.5	37.84	15.43	13.5	22.51	13.80	13.5	46.73	55.90	13.5	8.09	42.70
14.4	17.46	57.56	14.5	37.78	15.77	14.5	22.58	14.12	14.5	46.59	56.26	14.5	8.13	42.99
15.4	17.28	57.85	15.5	37.72	16.11	15.5	22.64	14.44	15.5	46.43	56.61	15.5	8.17	43.31
16.4	17.10	58.10	16.5	37.65	16.43	16.5	22.70	14.78	16.5	46.26	56.94	16.5	8.21	43.63
17.4	16.92	58.34	17.5	37.59	16.75	17.5	22.72	15.11	17.5	46.09	57.25	17.5	8.22	43.96
18.4	16.75	58.59	18.5	37.53	17.04	18.5	22.70	15.48	18.5	45.94	57.56	18.5	8.23	44.30
19.4	16.60	58.83	19.5	37.47	17.35	19.5	22.66	15.85	19.5	45.79	57.87	19.5	8.22	44.64
20.4	16.44	59.08	20.4	37.41	17.66	20.5	22.60	16.19	20.5	45.65	58.19	20.5	8.21	44.97
21.4	16.27	59.35	21.4	37.35	17.98	21.5	22.52	16.52	21.5	45.50	58.51	21.5	8.20	45.30
22.4	16.10	59.61	22.4	37.29	18.31	22.5	22.44	16.84	22.5	45.36	58.84	22.5	8.17	45.62
23.4	15.92	59.87	23.4	37.23	18.63	23.5	22.34	17.16	23.5	45.22	59.19	23.5	8.14	45.92
24.4	15.74	60.14	24.4	37.17	18.97	24.5	22.23	17.47	24.5	45.05	59.53	24.5	8.11	46.21
25.4	15.56	60.43	25.4	37.09	19.31	25.4	22.12	17.76	25.5	44.87	59.89	25.5	8.08	46.50
26.4	15.36	60.69	26.4	37.01	19.65	26.4	22.03	18.04	26.5	44.68	60.25	26.5	8.07	46.78
27.4	15.14	60.95	27.4	36.93	19.99	27.4	21.95	18.33	27.5	44.46	60.60	27.5	8.05	47.06
28.4	14.92	61.20	28.4	36.85	20.32	28.4	21.89	18.61	28.4	44.23	60.94	28.4	8.03	47.34
29.4	14.69	61.43	29.4	36.75	20.63	29.4	21.82	18.92	29.4	43.97	61.28	29.4	8.02	47.63
30.4	14.46	61.63	30.4	36.65	20.91	30.4	21.74	19.24	30.4	43.70	61.60	30.4	8.01	47.94
31.4	14.24	61.83	31.4	36.55	21.19	31.4	21.66	19.57	31.4	43.42	61.89	31.4	7.98	48.26
11.10	-11.06		6.21	-6.13		20.26	+20.23		18.59	-18.56		7.72	+7.66	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 5'49		7 ^h 14 ^m	18° 1'85		7 ^h 14 ^m	59° 0'83	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '	Jan.	h m	° '
	8 22	+88 51		9 8	-85 21		9 26	+81 39		9 36	-80 35		10 21	+82 56
	s	"		s	"		s	"		s	"		s	"
0.6	22.50	35.12	0.6	28.10	19.22	0.6	17.46	47.75	0.6	21.50	35.41	0.7	51.18	44.19
1.6	23.23	35.37	1.6	28.23	19.57	1.6	17.60	47.91	1.6	21.58	35.75	1.7	51.37	44.28
2.6	23.98	35.63	2.6	28.34	19.92	2.6	17.75	48.09	2.6	21.66	36.10	2.6	51.56	44.37
3.6	24.73	35.91	3.6	28.44	20.26	3.6	17.90	48.27	3.6	21.73	36.43	3.6	51.75	44.49
4.6	25.46	36.21	4.6	28.53	20.59	4.6	18.04	48.47	4.6	21.79	36.75	4.6	51.94	44.62
5.6	26.13	36.52	5.6	28.62	20.91	5.6	18.18	48.69	5.6	21.86	37.07	5.6	52.13	44.77
6.6	26.72	36.83	6.6	28.71	21.22	6.6	18.30	48.93	6.6	21.92	37.37	6.6	52.31	44.95
7.5	27.24	37.15	7.6	28.81	21.53	7.6	18.41	49.17	7.6	21.98	37.67	7.6	52.46	45.13
8.5	27.68	37.46	8.6	28.92	21.84	8.6	18.52	49.41	8.6	22.06	37.98	8.6	52.61	45.32
9.5	28.09	37.75	9.6	29.03	22.17	9.6	18.61	49.64	9.6	22.14	38.30	9.6	52.75	45.51
10.5	28.47	38.04	10.6	29.14	22.53	10.6	18.70	49.87	10.6	22.22	38.66	10.6	52.89	45.68
11.5	28.87	38.31	11.6	29.24	22.91	11.6	18.80	50.09	11.6	22.30	39.03	11.6	53.03	45.83
12.5	29.31	38.58	12.6	29.34	23.30	12.6	18.90	50.29	12.6	22.37	39.41	12.6	53.17	45.98
13.5	29.77	38.86	13.6	29.42	23.69	13.6	19.00	50.49	13.6	22.43	39.80	13.6	53.32	46.13
14.5	30.27	39.14	14.6	29.47	24.08	14.6	19.12	50.70	14.6	22.48	40.18	14.6	53.49	46.30
15.5	30.77	39.44	15.6	29.51	24.46	15.6	19.24	50.93	15.6	22.53	40.56	15.6	53.66	46.47
16.5	31.24	39.75	16.6	29.55	24.82	16.6	19.35	51.17	16.6	22.57	40.93	16.6	53.82	46.65
17.5	31.67	40.08	17.6	29.59	25.16	17.6	19.46	51.44	17.6	22.61	41.28	17.6	53.97	46.86
18.5	32.03	40.41	18.6	29.62	25.51	18.6	19.56	51.72	18.6	22.65	41.62	18.6	54.12	47.09
19.5	32.33	40.75	19.5	29.66	25.84	19.6	19.65	52.01	19.6	22.68	41.96	19.6	54.27	47.34
20.5	32.57	41.10	20.5	29.70	26.18	20.6	19.73	52.30	20.6	22.72	42.30	20.6	54.40	47.59
21.5	32.75	41.44	21.5	29.74	26.53	21.6	19.79	52.59	21.6	22.76	42.64	21.6	54.52	47.84
22.5	32.88	41.78	22.5	29.78	26.89	22.6	19.86	52.88	22.6	22.80	42.99	22.6	54.63	48.09
23.5	32.98	42.11	23.5	29.82	27.25	23.6	19.92	53.16	23.6	22.85	43.35	23.6	54.74	48.35
24.5	33.08	42.43	24.5	29.86	27.61	24.6	19.97	53.45	24.6	22.89	43.71	24.6	54.84	48.60
25.5	33.16	42.73	25.5	29.89	28.00	25.5	20.02	53.73	25.6	22.93	44.09	25.6	54.94	48.84
26.5	33.26	43.04	26.5	29.92	28.39	26.5	20.08	54.00	26.5	22.97	44.50	26.6	55.05	49.08
27.5	33.39	43.34	27.5	29.93	28.80	27.5	20.15	54.25	27.5	22.99	44.90	27.6	55.15	49.31
28.5	33.53	43.64	28.5	29.93	29.20	28.5	20.23	54.51	28.5	23.01	45.31	28.6	55.26	49.53
29.5	33.70	43.94	29.5	29.91	29.59	29.5	20.30	54.77	29.5	23.03	45.72	29.6	55.39	49.75
30.5	33.89	44.26	30.5	29.88	29.98	30.5	20.38	55.04	30.5	23.04	46.11	30.6	55.51	49.98
31.5	34.05	44.59	31.5	29.84	30.36	31.5	20.44	55.33	31.5	23.05	46.50	31.6	55.63	50.24
50.30	+50.29		12.35	-12.31		6.90	+6.83		6.12	-6.04		8.14	+8.08	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	11 0	-84 10	Jan.	12 14	+88 7	Jan.	12 46	-84 41	Jan.	12 48	+83 49	Jan.	13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
0.7	4.75	30.39	0.7	14.82	17.22	0.8	49.30	57.30	0.8	26.51	35.18	0.8	13.18	9.99
1.7	4.95	30.64	1.7	15.51	17.17	1.8	49.57	57.41	1.8	26.73	35.06	1.8	13.50	10.03
2.7	5.14	30.91	2.7	16.21	17.13	2.7	49.81	57.52	2.7	26.95	34.95	2.8	13.79	10.08
3.7	5.31	31.17	3.7	16.95	17.10	3.7	50.07	57.63	3.7	27.17	34.84	3.8	14.08	10.15
4.7	5.48	31.42	4.7	17.70	17.07	4.7	50.30	57.74	4.7	27.41	34.75	4.8	14.36	10.21
5.7	5.63	31.67	5.7	18.47	17.05	5.7	50.54	57.85	5.7	27.64	34.69	5.8	14.64	10.26
6.7	5.79	31.90	6.7	19.23	17.08	6.7	50.76	57.95	6.7	27.88	34.64	6.8	14.90	10.31
7.7	5.96	32.12	7.7	19.95	17.11	7.7	50.99	58.05	7.7	28.11	34.62	7.8	15.17	10.34
8.7	6.13	32.34	8.7	20.62	17.16	8.7	51.23	58.14	8.7	28.32	34.61	8.8	15.46	10.37
9.7	6.31	32.57	9.7	21.27	17.22	9.7	51.50	58.24	9.7	28.52	34.61	9.8	15.76	10.40
10.7	6.50	32.84	10.7	21.88	17.27	10.7	51.77	58.36	10.7	28.72	34.61	10.8	16.07	10.44
11.7	6.70	33.12	11.7	22.48	17.31	11.7	52.04	58.49	11.7	28.91	34.60	11.8	16.40	10.51
12.6	6.88	33.44	12.7	23.09	17.34	12.7	52.31	58.65	12.7	29.10	34.56	12.7	16.74	10.60
13.6	7.05	33.75	13.7	23.73	17.36	13.7	52.58	58.83	13.7	29.31	34.52	13.7	17.07	10.71
14.6	7.20	34.07	14.7	24.39	17.39	14.7	52.83	59.02	14.7	29.52	34.49	14.7	17.38	10.83
15.6	7.36	34.39	15.7	25.09	17.44	15.7	53.08	59.21	15.7	29.75	34.48	15.7	17.67	10.96
16.6	7.50	34.71	16.7	25.80	17.49	16.7	53.31	59.39	16.7	29.98	34.47	16.7	17.96	11.09
17.6	7.63	35.00	17.7	26.52	17.56	17.7	53.54	59.58	17.7	30.21	34.47	17.7	18.24	11.22
18.6	7.76	35.29	18.7	27.24	17.65	18.7	53.75	59.76	18.7	30.45	34.51	18.7	18.50	11.35
19.6	7.88	35.58	19.7	27.94	17.77	19.7	53.97	59.94	19.7	30.67	34.55	19.7	18.76	11.45
20.6	8.01	35.86	20.7	28.61	17.90	20.7	54.18	60.09	20.7	30.89	34.63	20.7	19.03	11.56
21.6	8.15	36.14	21.7	29.26	18.03	21.7	54.40	60.26	21.7	31.09	34.71	21.7	19.30	11.67
22.6	8.28	36.43	22.7	29.88	18.17	22.7	54.62	60.43	22.7	31.30	34.79	22.7	19.58	11.78
23.6	8.42	36.74	23.7	30.48	18.31	23.7	54.85	60.61	23.7	31.50	34.88	23.7	19.87	11.91
24.6	8.56	37.06	24.7	31.06	18.45	24.7	55.09	60.80	24.7	31.68	34.96	24.7	20.16	12.03
25.6	8.71	37.39	25.7	31.63	18.59	25.7	55.34	60.99	25.7	31.87	35.04	25.7	20.48	12.17
26.6	8.85	37.72	26.7	32.19	18.72	26.7	55.58	61.22	26.7	32.07	35.13	26.7	20.77	12.33
27.6	8.99	38.08	27.7	32.75	18.85	27.7	55.82	61.45	27.7	32.26	35.21	27.7	21.07	12.51
28.6	9.10	38.45	28.7	33.34	18.97	28.7	56.06	61.70	28.7	32.45	35.27	28.7	21.37	12.71
29.6	9.21	38.82	29.7	33.94	19.09	29.7	56.29	61.97	29.7	32.65	35.34	29.7	21.67	12.93
30.6	9.31	39.19	30.6	34.56	19.22	30.7	56.49	62.25	30.7	32.87	35.42	30.7	21.94	13.15
31.6	9.40	39.55	31.6	35.20	19.35	31.7	56.69	62.52	31.7	33.09	35.50	31.7	22.21	13.36
9.86	-9.80		30.51	+30.49		10.83	-10.78		9.30	+9.24		12.43	-12.39	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10'	46".79		+88° 7'	36".40		-84° 42'	20".01		+83° 49'	52".98		-85° 23'	33".94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	14 14	-83 18	Jan.	15 1	+87 31	Jan.	15 25	-84 12	Jan.	16 53	+82 9	Jan.	17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
0.8	23.19	37.20	0.8	17.21	37.52	0.9	11.69	22.35	0.9	37.86	59.20	0.9	54.39	13.01
1.8	23.42	37.17	1.8	17.54	37.25	1.9	11.93	22.21	1.9	37.91	58.26	1.9	54.51	12.76
2.8	23.62	37.16	2.8	17.91	36.99	2.9	12.16	22.08	2.9	37.96	58.50	2.9	54.61	12.51
3.8	23.82	37.16	3.8	18.31	36.72	3.9	12.39	21.98	3.9	38.02	58.14	3.9	54.72	12.28
4.8	24.03	37.16	4.8	18.73	36.45	4.9	12.59	21.89	4.9	38.10	57.77	4.9	54.83	12.06
5.8	24.22	37.15	5.8	19.16	36.21	5.9	12.80	21.80	5.9	38.18	57.40	5.9	54.92	11.83
6.8	24.40	37.13	6.8	19.62	36.00	6.8	13.00	21.69	6.9	38.26	57.07	6.9	55.01	11.61
7.8	24.59	37.10	7.8	20.08	35.80	7.8	13.19	21.56	7.9	38.34	56.74	7.9	55.09	11.38
8.8	24.79	37.06	8.8	20.51	35.62	8.8	13.39	21.42	8.9	38.43	56.44	8.9	55.17	11.14
9.8	24.99	37.03	9.8	20.95	35.45	9.8	13.62	21.27	9.9	38.51	56.15	9.9	55.27	10.87
10.8	25.22	37.02	10.8	21.37	35.28	10.8	13.85	21.13	10.9	38.59	55.87	10.9	55.38	10.61
11.8	25.45	37.01	11.8	21.76	35.11	11.8	14.10	21.01	11.9	38.67	55.59	11.9	55.49	10.34
12.8	25.68	37.02	12.8	22.14	34.93	12.8	14.36	20.91	12.9	38.75	55.32	12.9	55.62	10.09
13.8	25.92	37.06	13.8	22.53	34.74	13.8	14.63	20.82	13.9	38.82	55.03	13.9	55.76	9.85
14.8	26.16	37.12	14.8	22.95	34.54	14.8	14.88	20.77	14.9	38.90	54.71	14.9	55.90	9.63
15.8	26.38	37.19	15.8	23.40	34.35	15.8	15.13	20.72	15.9	38.99	54.39	15.9	56.04	9.43
16.8	26.59	37.27	16.8	23.86	34.15	16.8	15.38	20.68	16.9	39.09	54.07	16.9	56.17	9.24
17.8	26.79	37.34	17.8	24.35	33.96	17.8	15.61	20.63	17.9	39.19	53.75	17.9	56.28	9.06
18.8	26.98	37.40	18.8	24.86	33.80	18.8	15.83	20.59	18.9	39.32	53.46	18.9	56.39	8.89
19.8	27.17	37.46	19.8	25.37	33.65	19.8	16.05	20.55	19.9	39.44	53.16	19.9	56.52	8.71
20.8	27.37	37.51	20.8	25.89	33.52	20.8	16.28	20.50	20.9	39.56	52.89	20.9	56.63	8.52
21.8	27.56	37.55	21.8	26.41	33.42	21.8	16.51	20.45	21.9	39.68	52.62	21.9	56.74	8.33
22.8	27.77	37.59	22.8	26.91	33.32	22.8	16.74	20.38	22.9	39.81	52.37	22.9	56.85	8.14
23.8	27.97	37.64	23.8	27.40	33.23	23.8	16.97	20.32	23.9	39.93	52.13	23.9	56.98	7.93
24.7	28.20	37.70	24.8	27.88	33.15	24.8	17.21	20.26	24.9	40.05	51.90	24.9	57.10	7.72
25.7	28.42	37.78	25.8	28.35	33.06	25.8	17.46	20.22	25.9	40.16	51.68	25.9	57.23	7.51
26.7	28.65	37.87	26.8	28.82	32.98	26.8	17.73	20.18	26.9	40.27	51.45	26.9	57.37	7.31
27.7	28.88	37.97	27.8	29.28	32.90	27.8	18.00	20.17	27.8	40.38	51.23	27.9	57.52	7.12
28.7	29.11	38.10	28.8	29.74	32.80	28.8	18.28	20.17	28.8	40.51	51.00	28.9	57.67	6.96
29.7	29.33	38.24	29.8	30.21	32.69	29.8	18.55	20.20	29.8	40.63	50.76	29.9	57.83	6.81
30.7	29.55	38.39	30.8	30.71	32.58	30.8	18.80	20.23	30.8	40.75	50.51	30.9	57.99	6.67
31.7	29.75	38.55	31.8	31.22	32.48	31.8	19.05	20.28	31.8	40.88	50.25	31.9	58.14	6.56
8.58	-8.53		23.17	+23.15		9.91	-9.86		7.34	+7.27		6.24	-6.16	
14 ^h 14 ^m	23 ^s .592		15 ^h 1 ^m	45 ^s .970		15 ^h 25 ^m	17 ^s .036		16 ^h 53 ^m	48 ^s .037		17 ^h 17 ^m	1 ^s .936	
-83° 19'	1''42		+87° 31'	46''68		-84° 12'	45''34		+82° 9'	58''64		-80° 47'	29''50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	17 56	+86 36	Jan.	18 9	-87 39	Jan.	18 54	+89 1	Jan.	19 35	-89 12	Jan.	20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
0.9	42.02	56.59	0.9	11.43	36.11	1.0	14.55	43.78	1.0	4.17	37.75	1.1	10.22	68.31
1.9	42.00	56.26	1.9	11.70	35.78	2.0	14.14	43.46	2.0	4.30	37.40	2.1	10.12	68.08
2.9	41.99	55.90	2.9	11.98	35.49	3.0	13.74	43.13	3.0	4.48	37.06	3.1	10.01	67.81
3.9	41.99	55.54	3.9	12.25	35.20	4.0	13.39	42.77	4.0	4.69	36.72	4.1	9.89	67.53
4.9	42.03	55.17	4.9	12.52	34.92	4.9	13.10	42.41	5.0	4.89	36.41	5.1	9.79	67.22
5.9	42.08	54.79	5.9	12.76	34.64	5.9	12.90	42.04	6.0	5.04	36.09	6.1	9.69	66.91
6.9	42.14	54.43	6.9	12.99	34.36	6.9	12.79	41.67	7.0	5.14	35.78	7.1	9.59	66.60
7.9	42.23	54.08	7.9	13.20	34.07	7.9	12.75	41.33	8.0	5.18	35.46	8.1	9.51	66.28
8.9	42.33	53.75	8.9	13.42	33.76	8.9	12.76	40.99	9.0	5.21	35.13	9.1	9.45	65.97
9.9	42.44	53.42	9.9	13.66	33.43	9.9	12.80	40.67	10.0	5.28	34.76	10.1	9.38	65.68
10.9	42.53	53.13	10.9	13.93	33.10	10.9	12.81	40.37	11.0	5.41	34.38	11.1	9.32	65.40
11.9	42.62	52.84	11.9	14.24	32.77	11.9	12.78	40.08	12.0	5.67	33.99	12.1	9.26	65.14
12.9	42.70	52.53	12.9	14.59	32.44	12.9	12.71	39.76	13.0	6.04	33.61	13.1	9.19	64.88
13.9	42.78	52.21	13.9	14.97	32.13	13.9	12.61	39.45	14.0	6.51	33.23	14.1	9.12	64.60
14.9	42.85	51.89	14.9	15.38	31.83	14.9	12.53	39.12	14.9	7.06	32.87	15.1	9.05	64.31
15.9	42.94	51.55	15.9	15.77	31.55	15.9	12.47	38.78	15.9	7.63	32.53	16.0	8.97	63.99
16.9	43.04	51.21	16.9	16.14	31.30	16.9	12.48	38.43	16.9	8.20	32.21	17.0	8.90	63.67
17.9	43.18	50.86	17.9	16.51	31.05	17.9	12.56	38.08	17.9	8.72	31.88	18.0	8.84	63.33
18.9	43.32	50.51	18.9	16.85	30.80	18.9	12.73	37.72	18.9	9.22	31.56	19.0	8.78	62.98
19.9	43.50	50.17	19.9	17.19	30.55	19.9	12.96	37.36	19.9	9.67	31.25	20.0	8.73	62.63
20.9	43.68	49.84	20.9	17.52	30.28	20.9	13.26	37.02	20.9	10.11	30.93	21.0	8.68	62.29
21.9	43.87	49.52	21.9	17.86	30.01	21.9	13.59	36.68	21.9	10.54	30.61	22.0	8.65	61.94
22.9	44.06	49.24	22.9	18.22	29.74	22.9	13.97	36.36	22.9	10.99	30.28	23.0	8.62	61.59
23.9	44.25	48.96	23.9	18.58	29.46	23.9	14.35	36.04	23.9	11.47	29.93	24.0	8.59	61.26
24.9	44.45	48.68	24.9	18.95	29.18	24.9	14.74	35.75	24.9	12.01	29.57	25.0	8.56	60.94
25.9	44.64	48.41	25.9	19.36	28.89	25.9	15.12	35.45	25.9	12.61	29.21	26.0	8.55	60.63
26.9	44.83	48.16	26.9	19.78	28.61	26.9	15.45	35.15	26.9	13.30	28.87	27.0	8.52	60.32
27.9	45.01	47.88	27.9	20.25	28.34	27.9	15.79	34.86	27.9	14.09	28.52	28.0	8.49	60.01
28.9	45.18	47.60	28.9	20.75	28.09	28.9	16.08	34.56	28.9	14.97	28.17	29.0	8.47	59.70
29.9	45.36	47.32	29.9	21.26	27.85	29.9	16.37	34.24	29.9	15.93	27.83	30.0	8.44	59.38
30.9	45.55	47.02	30.9	21.78	27.63	30.9	16.69	33.92	30.9	16.92	27.50	31.0	8.41	59.05
31.9	45.75	46.71	31.9	22.29	27.43	31.9	17.05	33.59	31.9	17.93	27.18	32.0	8.38	58.69
16.93	+16.90		24.48	-24.46		58.92	+58.91		72.44	-72.43		7.42	+7.35	
17 ^h 57 ^m	4° 32' 6"		18 ^h 9 ^m	46° 18' 6"		18 ^h 55 ^m	23° 39' 3"		19 ^h 37 ^m	1° 7' 35"		20 ^h 48 ^m	15° 38' 5"	
+86° 36'	50'' 43		-87° 39'	48'' 39		+89° 1'	32'' 83		-89° 12'	41'' 41		+82° 14'	50'' 67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Jan.	21 39	-83 4	Jan.	22 16	-86 21	Jan.	22 38	-81 47	Jan.	23 27	+86 53	Jan.	23 47	-82 27
	s	"		s	"		s	"		s	"		s	"
1.1	3.81	38.21	1.1	59.93	51.35	1.2	7.57	24.43	1.2	46.74	18.31	1.2	30.70	8.32
2.1	3.73	37.92	2.1	59.72	51.07	2.2	7.47	24.18	2.2	46.34	18.28	2.2	30.55	8.15
3.1	3.67	37.62	3.1	59.53	50.80	3.2	7.37	23.93	3.2	45.93	18.25	3.2	30.41	7.98
4.1	3.60	37.33	4.1	59.35	50.53	4.2	7.29	23.70	4.2	45.51	18.20	4.2	30.28	7.81
5.1	3.54	37.05	5.1	59.17	50.28	5.2	7.21	23.46	5.2	45.05	18.12	5.2	30.16	7.66
6.1	3.48	36.79	6.1	58.99	50.03	6.2	7.12	23.25	6.2	44.62	18.03	6.2	30.04	7.51
7.1	3.39	36.53	7.1	58.80	49.77	7.1	7.02	23.04	7.2	44.20	17.90	7.2	29.91	7.37
8.1	3.31	36.26	8.1	58.60	49.52	8.1	6.92	22.82	8.2	43.82	17.78	8.2	29.77	7.23
9.1	3.23	35.98	9.1	58.37	49.26	9.1	6.82	22.60	9.2	43.45	17.65	9.2	29.62	7.09
10.1	3.14	35.68	10.1	58.14	48.98	10.1	6.71	22.36	10.2	43.11	17.54	10.2	29.46	6.92
11.1	3.05	35.36	11.1	57.91	48.68	11.1	6.60	22.09	11.2	42.77	17.43	11.2	29.30	6.75
12.1	2.98	35.02	12.1	57.70	48.36	12.1	6.50	21.81	12.2	42.44	17.32	12.2	29.15	6.55
13.1	2.92	34.67	13.1	57.50	48.03	13.1	6.41	21.50	13.2	42.11	17.22	13.2	29.01	6.32
14.1	2.87	34.32	14.1	57.34	47.69	14.1	6.33	21.19	14.2	41.75	17.13	14.2	28.87	6.08
15.1	2.83	33.97	15.1	57.19	47.36	15.1	6.26	20.90	15.2	41.38	17.02	15.2	28.76	5.84
16.1	2.80	33.63	16.1	57.06	47.03	16.1	6.20	20.60	16.2	41.00	16.89	16.2	28.65	5.61
17.1	2.77	33.31	17.1	56.94	46.71	17.1	6.14	20.31	17.2	40.60	16.75	17.2	28.54	5.38
18.1	2.74	33.00	18.1	56.82	46.42	18.1	6.07	20.03	18.2	40.21	16.58	18.2	28.42	5.16
19.1	2.71	32.71	19.1	56.69	46.13	19.1	6.01	19.76	19.1	39.83	16.40	19.2	28.31	4.94
20.1	2.67	32.41	20.1	56.56	45.84	20.1	5.94	19.49	20.1	39.46	16.27	20.2	28.20	4.74
21.1	2.62	32.10	21.1	56.42	45.55	21.1	5.86	19.22	21.1	39.12	16.01	21.2	28.07	4.54
22.1	2.58	31.78	22.1	56.27	45.24	22.1	5.78	18.95	22.1	38.78	15.80	22.2	27.94	4.32
23.1	2.53	31.46	23.1	56.11	44.93	23.1	5.70	18.67	23.1	38.46	15.59	23.2	27.81	4.10
24.1	2.48	31.13	24.1	55.96	44.60	24.1	5.62	18.36	24.1	38.17	15.38	24.1	27.68	3.87
25.1	2.44	30.79	25.1	55.82	44.26	25.1	5.54	18.05	25.1	37.88	15.18	25.1	27.55	3.63
26.1	2.40	30.43	26.1	55.68	43.92	26.1	5.48	17.74	26.1	37.59	14.98	26.1	27.43	3.36
27.1	2.37	30.06	27.1	55.55	43.55	27.1	5.41	17.41	27.1	37.30	14.79	27.1	27.31	3.10
28.1	2.36	29.68	28.1	55.45	43.17	28.1	5.36	17.06	28.1	37.02	14.60	28.1	27.20	2.81
29.0	2.36	29.30	29.1	55.38	42.81	29.1	5.31	16.70	29.1	36.71	14.41	29.1	27.10	2.50
30.0	2.37	28.92	30.1	55.32	42.44	30.1	5.27	16.34	30.1	36.40	14.22	30.1	27.00	2.18
31.0	2.39	28.57	31.1	55.28	42.07	31.1	5.24	16.00	31.1	36.09	14.02	31.1	26.91	1.87
32.0	2.41	28.23	32.1	55.24	41.72	32.1	5.23	15.67	32.1	35.76	13.80	32.1	26.83	1.58
8.30 -8.23			15.76 -15.73			7.00 -6.93			18.42 +18.39			7.61 -7.55		
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '		Feb.	h m ° '	
	0 57	+85 50		1 32	+88 53		1 41	-85 9		4 11	+85 21		5 37	+85 9
	s "			s "			s "			s "			s "	
0.2	56.90	58.35	0.2	85.65	50.83	0.2	29.52	55.10	0.3	59.96	15.52	0.4	18.64	46.90
1.2	56.60	58.26	1.2	84.45	50.79	1.2	29.29	54.91	1.3	59.73	15.71	1.4	18.49	47.18
2.2	56.30	58.13	2.2	83.23	50.74	2.2	29.07	54.73	2.3	59.49	15.88	2.4	18.32	47.45
3.2	56.00	57.99	3.2	82.01	50.67	3.2	28.84	54.56	3.3	59.21	16.03	3.4	18.13	47.70
4.2	55.70	57.82	4.2	80.83	50.56	4.2	28.61	54.41	4.3	58.94	16.15	4.4	17.93	47.94
5.2	55.42	57.65	5.2	79.72	50.43	5.2	28.37	54.26	5.3	58.68	16.25	5.4	17.72	48.14
6.2	55.17	57.47	6.2	78.67	50.29	6.2	28.10	54.11	6.3	58.43	16.34	6.4	17.52	48.34
7.2	54.93	57.29	7.2	77.69	50.16	7.2	27.84	53.94	7.3	58.18	16.42	7.4	17.33	48.51
8.2	54.70	57.12	8.2	76.77	50.03	8.2	27.57	53.76	8.3	57.95	16.49	8.4	17.15	48.68
9.2	54.49	56.97	9.2	75.85	49.92	9.2	27.30	53.54	9.3	57.73	16.57	9.3	16.98	48.85
10.2	54.27	56.83	10.2	74.90	49.82	10.2	27.05	53.32	10.3	57.52	16.66	10.3	16.82	49.04
11.1	54.04	56.68	11.2	73.93	49.73	11.2	26.81	53.09	11.3	57.30	16.76	11.3	16.65	49.24
12.1	53.79	56.53	12.2	72.90	49.63	12.2	26.57	52.85	12.3	57.07	16.86	12.3	16.48	49.45
13.1	53.52	56.36	13.2	71.82	49.51	13.2	26.37	52.60	13.3	56.82	16.96	13.3	16.29	49.65
14.1	53.26	56.17	14.2	70.71	49.37	14.2	26.16	52.36	14.3	56.55	17.06	14.3	16.07	49.86
15.1	52.99	55.97	15.2	69.60	49.22	15.2	25.95	52.13	15.3	56.27	17.15	15.3	15.85	50.06
16.1	52.74	55.75	16.2	68.52	49.05	16.2	25.74	51.92	16.3	55.98	17.21	16.3	15.62	50.25
17.1	52.49	55.52	17.2	67.46	48.87	17.2	25.54	51.69	17.3	55.69	17.26	17.3	15.37	50.40
18.1	52.24	55.27	18.2	66.44	48.67	18.2	25.32	51.47	18.3	55.40	17.28	18.3	15.12	50.56
19.1	52.02	55.02	19.2	65.48	48.46	19.2	25.10	51.25	19.3	55.12	17.30	19.3	14.87	50.70
20.1	51.81	54.77	20.1	64.56	48.24	20.2	24.87	51.03	20.3	54.84	17.30	20.3	14.63	50.81
21.1	51.61	54.53	21.1	63.67	48.02	21.2	24.65	50.81	21.3	54.57	17.29	21.3	14.39	50.92
22.1	51.42	54.28	22.1	62.83	47.82	22.1	24.42	50.57	22.3	54.33	17.28	22.3	14.15	51.02
23.1	51.23	54.03	23.1	62.03	47.61	23.1	24.19	50.32	23.2	54.08	17.26	23.3	13.93	51.13
24.1	51.07	53.80	24.1	61.24	47.42	24.1	23.96	50.05	24.2	53.84	17.25	24.3	13.72	51.23
25.1	50.89	53.58	25.1	60.46	47.23	25.1	23.76	49.76	25.2	53.60	17.26	25.3	13.51	51.35
26.1	50.71	53.36	26.1	59.64	47.05	26.1	23.56	49.45	26.2	53.37	17.27	26.3	13.31	51.47
27.1	50.52	53.14	27.1	58.78	46.87	27.1	23.36	49.14	27.2	53.12	17.29	27.3	13.08	51.60
28.1	50.32	52.91	28.1	57.89	46.68	28.1	23.18	48.83	28.2	52.86	17.30	28.3	12.86	51.73
29.1	50.11	52.67	29.1	56.96	46.48	29.1	23.03	48.51	29.2	52.58	17.31	29.3	12.63	51.86
30.1	49.91	52.40	30.1	56.05	46.25	30.1	22.87	48.22	30.2	52.30	17.31	30.3	12.38	51.97
31.1	49.71	52.11	31.1	55.17	46.01	31.1	22.70	47.93	31.2	52.01	17.28	31.3	12.11	52.07
13.81	+13.78		51.95	+51.94		11.86	-11.82		12.35	+12.31		11.86	+11.82	
0 ^h 57 ^m	55°.489		1 ^h 33 ^m	11°.898		1 ^h 41 ^m	39°.995		4 ^h 11 ^m	48°.583		5 ^h 37 ^m	5°.478	
+85° 50'	41".77		+88° 53'	34".33		-85° 9'	32".70		+85° 21'	5".69		+85° 9'	42".71	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m 5 45	° ' -84 50	Feb.	h m 6 46	° ' -80 44	Feb.	h m 7 5	° ' +87 10	Feb.	h m 7 14	° ' -86 55	Feb.	h m 7 15	° ' +82 33
	s 14.24	" 1.83		s 36.55	" 21.19		s 21.66	" 19.57		s 43.42	" 1.89		s 7.98	" 48.26
0.4	14.24	1.83	0.4	36.55	21.19	0.4	21.66	19.57	0.4	43.42	1.89	0.4	7.98	48.26
1.4	14.01	2.00	1.4	36.45	21.46	1.4	21.56	19.89	1.4	43.15	2.17	1.4	7.95	48.58
2.4	13.78	2.17	2.4	36.36	21.72	2.4	21.42	20.23	2.4	42.90	2.44	2.4	7.91	48.91
3.4	13.58	2.36	3.4	36.27	21.98	3.4	21.25	20.56	3.4	42.65	2.72	3.4	7.86	49.24
4.4	13.38	2.56	4.4	36.18	22.24	4.4	21.06	20.88	4.4	42.41	3.01	4.4	7.80	49.55
5.4	13.16	2.76	5.4	36.09	22.52	5.4	20.83	21.18	5.4	42.17	3.32	5.4	7.72	49.84
6.4	12.93	2.99	6.4	36.00	22.82	6.4	20.60	21.46	6.4	41.92	3.64	6.4	7.64	50.12
7.4	12.70	3.21	7.4	35.90	23.13	7.4	20.41	21.71	7.4	41.66	3.96	7.4	7.58	50.37
8.4	12.46	3.44	8.4	35.79	23.43	8.4	20.21	21.95	8.4	41.38	4.28	8.4	7.51	50.61
9.4	12.21	3.64	9.4	35.68	23.72	9.4	20.02	22.19	9.4	41.07	4.61	9.4	7.46	50.86
10.3	11.94	3.84	10.4	35.57	24.00	10.4	19.85	22.46	10.4	40.74	4.93	10.4	7.41	51.12
11.3	11.67	4.01	11.4	35.44	24.26	11.4	19.69	22.72	11.4	40.41	5.21	11.4	7.36	51.39
12.3	11.41	4.14	12.4	35.32	24.50	12.4	19.52	23.01	12.4	40.07	5.48	12.4	7.30	51.66
13.3	11.16	4.27	13.4	35.20	24.72	13.4	19.32	23.30	13.4	39.72	5.73	13.4	7.24	51.95
14.3	10.91	4.40	14.4	35.08	24.94	14.4	19.09	23.60	14.4	39.38	5.98	14.4	7.16	52.25
15.3	10.68	4.53	15.4	34.96	25.15	15.4	18.83	23.90	15.4	39.05	6.22	15.4	7.07	52.54
16.3	10.44	4.65	16.4	34.85	25.37	16.4	18.56	24.18	16.4	38.73	6.46	16.4	6.97	52.83
17.3	10.20	4.78	17.4	34.74	25.58	17.4	18.25	24.46	17.4	38.42	6.70	17.4	6.87	53.11
18.3	9.96	4.91	18.4	34.63	25.81	18.4	17.93	24.73	18.4	38.11	6.95	18.4	6.76	53.36
19.3	9.72	5.05	19.4	34.52	26.03	19.4	17.61	24.97	19.4	37.79	7.22	19.4	6.63	53.61
20.3	9.46	5.19	20.4	34.40	26.26	20.4	17.29	25.21	20.4	37.47	7.48	20.4	6.51	53.85
21.3	9.21	5.34	21.4	34.27	26.50	21.4	16.97	25.43	21.4	37.14	7.75	21.4	6.40	54.08
22.3	8.94	5.48	22.4	34.14	26.73	22.4	16.65	25.64	22.4	36.80	8.01	22.4	6.29	54.30
23.3	8.66	5.61	23.4	34.01	26.96	23.4	16.36	25.84	23.4	36.44	8.27	23.4	6.18	54.50
24.3	8.38	5.72	24.4	33.88	27.19	24.4	16.06	26.05	24.4	36.06	8.52	24.4	6.08	54.70
25.3	8.11	5.83	25.4	33.75	27.39	25.4	15.78	26.25	25.4	35.65	8.77	25.4	5.99	54.92
26.3	7.82	5.92	26.3	33.61	27.58	26.4	15.51	26.48	26.4	35.24	9.00	26.4	5.90	55.14
27.3	7.53	5.99	27.3	33.47	27.76	27.4	15.24	26.70	27.4	34.82	9.20	27.4	5.81	55.37
28.3	7.25	6.05	28.3	33.32	27.90	28.4	14.94	26.94	28.4	34.40	9.39	28.4	5.71	55.60
29.3	6.97	6.09	29.3	33.18	28.05	29.4	14.62	27.17	29.4	33.99	9.57	29.4	5.60	55.84
30.3	6.70	6.13	30.3	33.04	28.19	30.4	14.27	27.40	30.4	33.61	9.75	30.4	5.47	56.08
31.3	6.44	6.18	31.3	32.90	28.34	31.3	13.90	27.61	31.4	33.22	9.93	31.4	5.33	56.31
11.11	-11.06		6.22	-6.13		20.28	+20.25		18.60	-18.57		7.73	+7.66	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 5'49		7 ^h 14 ^m	18° 1'85		7 ^h 14 ^m	59° 0'83	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '
	8 22	+88 51		9 8	-85 21		9 26	+81 39		9 36	-80 35		10 21	+82 56
	s	"		s	"		s	"		s	"		s	"
0.5	34.05	44.59	0.5	29.84	30.36	0.5	20.44	55.33	0.5	23.05	46.50	0.6	55.63	50.24
1.5	34.18	44.95	1.5	29.80	30.72	1.5	20.51	55.64	1.5	23.04	46.87	1.6	55.74	50.52
2.5	34.21	45.30	2.5	29.76	31.06	2.5	20.57	55.97	2.5	23.04	47.22	2.6	55.85	50.82
3.5	34.18	45.66	3.5	29.72	31.40	3.5	20.61	56.30	3.5	23.05	47.58	3.6	55.95	51.13
4.5	34.05	46.00	4.5	29.69	31.76	4.5	20.64	56.63	4.5	23.06	47.93	4.6	56.03	51.44
5.5	33.87	46.34	5.5	29.67	32.11	5.5	20.67	56.95	5.5	23.06	48.29	5.6	56.09	51.75
6.5	33.66	46.66	6.5	29.65	32.48	6.5	20.68	57.26	6.5	23.07	48.68	6.6	56.15	52.04
7.5	33.46	46.96	7.5	29.63	32.88	7.5	20.69	57.55	7.5	23.08	49.08	7.6	56.21	52.32
8.5	33.26	47.25	8.5	29.60	33.29	8.5	20.72	57.82	8.5	23.09	49.50	8.5	56.27	52.58
9.5	33.11	47.53	9.5	29.54	33.70	9.5	20.75	58.09	9.5	23.09	49.91	9.5	56.34	52.84
10.5	33.00	47.82	10.5	29.47	34.11	10.5	20.78	58.37	10.5	23.08	50.32	10.5	56.42	53.09
11.5	32.91	48.13	11.5	29.39	34.50	11.5	20.81	58.66	11.5	23.07	50.74	11.5	56.49	53.36
12.5	32.78	48.45	12.5	29.30	34.88	12.5	20.85	58.97	12.5	23.05	51.13	12.5	56.57	53.65
13.4	32.63	48.78	13.5	29.19	35.23	13.5	20.88	59.28	13.5	23.02	51.51	13.5	56.64	53.95
14.4	32.41	49.12	14.5	29.09	35.57	14.5	20.89	59.61	14.5	22.99	51.87	14.5	56.70	54.26
15.4	32.14	49.46	15.5	29.00	35.91	15.5	20.90	59.95	15.5	22.96	52.22	15.5	56.76	54.58
16.4	31.79	49.80	16.5	28.91	36.25	16.5	20.90	60.29	16.5	22.94	52.57	16.5	56.81	54.92
17.4	31.39	50.14	17.5	28.82	36.58	17.5	20.89	60.63	17.5	22.91	52.92	17.5	56.85	55.27
18.4	30.94	50.47	18.5	28.73	36.92	18.5	20.87	60.97	18.5	22.88	53.28	18.5	56.88	55.62
19.4	30.46	50.77	19.5	28.65	37.26	19.5	20.84	61.30	19.5	22.85	53.64	19.5	56.90	55.95
20.4	29.95	51.06	20.5	28.56	37.62	20.5	20.81	61.62	20.5	22.83	54.01	20.5	56.91	56.28
21.4	29.44	51.35	21.5	28.47	37.99	21.5	20.79	61.92	21.5	22.81	54.38	21.5	56.92	56.59
22.4	28.94	51.63	22.5	28.38	38.37	22.5	20.77	62.22	22.5	22.79	54.76	22.5	56.93	56.88
23.4	28.46	51.91	23.5	28.28	38.74	23.5	20.74	62.50	23.5	22.76	55.17	23.5	56.94	57.17
24.4	28.00	52.18	24.5	28.15	39.12	24.5	20.73	62.78	24.5	22.73	55.57	24.5	56.95	57.46
25.4	27.58	52.45	25.4	28.02	39.50	25.5	20.72	63.07	25.5	22.69	55.96	25.5	56.98	57.75
26.4	27.17	52.74	26.4	27.87	39.86	26.5	20.71	63.36	26.5	22.64	56.35	26.5	57.01	58.05
27.4	26.76	53.01	27.4	27.70	40.20	27.5	20.70	63.65	27.5	22.58	56.72	27.5	57.04	58.36
28.4	26.32	53.32	28.4	27.53	40.54	28.5	20.69	63.97	28.5	22.52	57.07	28.5	57.06	58.68
29.4	25.83	53.62	29.4	27.37	40.86	29.5	20.66	64.30	29.5	22.46	57.41	29.5	57.07	59.01
30.4	25.25	53.92	30.4	27.20	41.17	30.4	20.62	64.63	30.5	22.40	57.74	30.5	57.08	59.34
31.4	24.61	54.21	31.4	27.06	41.48	31.4	20.58	64.96	31.5	22.34	58.07	31.5	57.07	59.69
50.43	+50.42		12.36	-12.32		6.90	+6.83		6.12	-6.04		8.15	+8.09	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '
	11 0	-84 10		12 14	+88 7		12 46	-84 42		12 48	+83 49		13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
0.6	9.40	39.55	0.6	35.20	19.35	0.7	56.69	2.52	0.7	33.09	35.50	0.7	22.21	13.36
1.6	9.48	39.89	1.6	35.85	19.52	1.7	56.88	2.79	1.7	33.29	35.60	1.7	22.45	13.56
2.6	9.56	40.23	2.6	36.48	19.70	2.7	57.07	3.03	2.7	33.50	35.72	2.7	22.69	13.76
3.6	9.64	40.57	3.6	37.10	19.89	3.7	57.26	3.28	3.7	33.70	35.86	3.7	22.93	13.96
4.6	9.72	40.90	4.6	37.66	20.12	4.7	57.45	3.51	4.7	33.90	36.03	4.7	23.18	14.15
5.6	9.82	41.23	5.6	38.18	20.34	5.7	57.65	3.75	5.7	34.08	36.20	5.7	23.44	14.34
6.6	9.92	41.59	6.6	38.65	20.56	6.7	57.86	3.99	6.7	34.25	36.38	6.7	23.71	14.53
7.6	10.02	41.95	7.6	39.11	20.76	7.7	58.08	4.26	7.7	34.40	36.55	7.7	24.00	14.75
8.6	10.12	42.33	8.6	39.56	20.95	8.6	58.30	4.54	8.6	34.56	36.70	8.7	24.29	14.98
9.6	10.22	42.74	9.6	40.01	21.13	9.6	58.50	4.86	9.6	34.73	36.84	9.7	24.57	15.22
10.6	10.29	43.15	10.6	40.48	21.32	10.6	58.71	5.18	10.6	34.91	36.98	10.7	24.86	15.50
11.6	10.35	43.54	11.6	41.00	21.51	11.6	58.90	5.51	11.6	35.08	37.12	11.7	25.11	15.77
12.6	10.40	43.93	12.6	41.53	21.71	12.6	59.08	5.83	12.6	35.26	37.28	12.7	25.36	16.04
13.6	10.45	44.31	13.6	42.05	21.94	13.6	59.23	6.15	13.6	35.45	37.46	13.7	25.59	16.31
14.6	10.49	44.68	14.6	42.57	22.18	14.6	59.39	6.45	14.6	35.64	37.64	14.7	25.79	16.57
15.6	10.52	45.04	15.6	43.09	22.43	15.6	59.54	6.75	15.6	35.81	37.84	15.7	26.01	16.82
16.6	10.56	45.38	16.6	43.57	22.70	16.6	59.69	7.04	16.6	35.98	38.07	16.7	26.23	17.07
17.6	10.60	45.73	17.6	44.01	22.98	17.6	59.84	7.32	17.6	36.15	38.31	17.6	26.44	17.31
18.5	10.64	46.09	18.6	44.43	23.26	18.6	60.00	7.61	18.6	36.30	38.55	18.6	26.66	17.55
19.5	10.69	46.46	19.6	44.82	23.55	19.6	60.17	7.90	19.6	36.44	38.80	19.6	26.88	17.79
20.5	10.74	46.82	20.6	45.19	23.83	20.6	60.34	8.21	20.6	36.58	39.04	20.6	27.11	18.04
21.5	10.78	47.19	21.6	45.52	24.09	21.6	60.50	8.52	21.6	36.71	39.29	21.6	27.35	18.31
22.5	10.83	47.57	22.6	45.84	24.36	22.6	60.67	8.83	22.6	36.83	39.53	22.6	27.59	18.58
23.5	10.88	47.97	23.6	46.16	24.65	23.6	60.84	9.16	23.6	36.96	39.77	23.6	27.82	18.87
24.5	10.91	48.38	24.6	46.48	24.89	24.6	61.00	9.52	24.6	37.09	40.00	24.6	28.05	19.18
25.5	10.92	48.80	25.6	46.82	25.14	25.6	61.15	9.89	25.6	37.22	40.23	25.6	28.28	19.50
26.5	10.93	49.22	26.6	47.19	25.39	26.6	61.29	10.25	26.6	37.35	40.45	26.6	28.49	19.83
27.5	10.93	49.63	27.6	47.55	25.66	27.6	61.41	10.62	27.6	37.49	40.66	27.6	28.69	20.17
28.5	10.92	50.01	28.6	47.92	25.93	28.6	61.52	10.98	28.6	37.64	40.88	28.6	28.87	20.51
29.5	10.90	50.39	29.6	48.29	26.22	29.6	61.63	11.35	29.6	37.79	41.14	29.6	29.04	20.84
30.5	10.88	50.76	30.6	48.63	26.53	30.6	61.73	11.68	30.6	37.92	41.42	30.6	29.20	21.16
31.5	10.87	51.11	31.6	48.94	26.85	31.6	61.83	12.01	31.6	38.05	41.71	31.6	29.37	21.46
9.86	-9.81		30.53	+30.51		10.83	-10.78		9.30	+9.25		12.44	-12.40	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10'	46''.79		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '	Feb.	h m	° '
	14 14	-83 18		15 1	+87 31		15 25	-84 12		16 53	+82 9		17 16	-80 47
	s	"		s	"		s	"		s	"		s	"
0.7	29.75	38.55	0.8	31.22	32.48	0.8	19.05	20.28	0.8	40.88	50.25	0.9	58.14	6.56
1.7	29.95	38.71	1.8	31.77	32.39	1.8	19.30	20.33	1.8	41.02	50.00	1.9	58.29	6.45
2.7	30.14	38.85	2.8	32.32	32.32	2.8	19.53	20.37	2.8	41.17	49.76	2.8	58.43	6.34
3.7	30.31	38.98	3.8	32.87	32.26	3.8	19.76	20.41	3.8	41.32	49.56	3.8	58.57	6.21
4.7	30.50	39.11	4.8	33.40	32.24	4.8	19.99	20.42	4.8	41.47	49.36	4.8	58.70	6.08
5.7	30.69	39.23	5.7	33.93	32.24	5.8	20.23	20.43	5.8	41.62	49.19	5.8	58.84	5.94
6.7	30.92	39.36	6.7	34.44	32.25	6.8	20.48	20.45	6.8	41.76	49.04	6.8	58.98	5.78
7.7	31.13	39.50	7.7	34.92	32.27	7.8	20.75	20.48	7.8	41.91	48.90	7.8	59.13	5.62
8.7	31.35	39.67	8.7	35.38	32.27	8.8	21.03	20.51	8.8	42.04	48.76	8.8	59.30	5.48
9.7	31.58	39.84	9.7	35.85	32.26	9.8	21.31	20.56	9.8	42.18	48.60	9.8	59.47	5.35
10.7	31.80	40.04	10.7	36.31	32.23	10.8	21.59	20.65	10.8	42.31	48.43	10.8	59.64	5.24
11.7	32.00	40.26	11.7	36.81	32.20	11.8	21.86	20.75	11.8	42.45	48.26	11.8	59.81	5.15
12.7	32.20	40.47	12.7	37.32	32.19	12.7	22.11	20.86	12.8	42.60	48.09	12.8	59.98	5.09
13.7	32.39	40.69	13.7	37.86	32.19	13.7	22.35	20.97	13.8	42.76	47.91	13.8	60.13	5.03
14.7	32.57	40.91	14.7	38.41	32.20	14.7	22.59	21.08	14.8	42.91	47.75	14.8	60.29	4.97
15.7	32.74	41.11	15.7	38.96	32.23	15.7	22.82	21.18	15.8	43.09	47.60	15.8	60.44	4.91
16.7	32.91	41.30	16.7	39.51	32.26	16.7	23.05	21.27	16.8	43.25	47.47	16.8	60.58	4.83
17.7	33.08	41.49	17.7	40.04	32.31	17.7	23.27	21.36	17.8	43.43	47.35	17.8	60.72	4.75
18.7	33.25	41.68	18.7	40.57	32.40	18.7	23.50	21.45	18.8	43.60	47.25	18.8	60.86	4.68
19.7	33.43	41.87	19.7	41.09	32.50	19.7	23.74	21.53	19.8	43.75	47.16	19.8	61.01	4.60
20.7	33.62	42.06	20.7	41.58	32.60	20.7	23.98	21.62	20.8	43.91	47.10	20.8	61.16	4.52
21.7	33.81	42.26	21.7	42.06	32.70	21.7	24.23	21.71	21.8	44.07	47.03	21.8	61.31	4.43
22.7	34.00	42.48	22.7	42.53	32.80	22.7	24.48	21.82	22.8	44.23	46.97	22.8	61.49	4.36
23.7	34.20	42.72	23.7	42.99	32.88	23.7	24.75	21.95	23.8	44.39	46.91	23.8	61.66	4.30
24.7	34.40	42.96	24.7	43.44	32.97	24.7	25.02	22.08	24.8	44.54	46.85	24.8	61.83	4.25
25.7	34.59	43.22	25.7	43.90	33.05	25.7	25.28	22.23	25.8	44.70	46.76	25.8	62.02	4.21
26.7	34.78	43.50	26.7	44.37	33.11	26.7	25.53	22.41	26.8	44.85	46.68	26.8	62.20	4.20
27.7	34.96	43.78	27.7	44.85	33.17	27.7	25.78	22.60	27.8	45.00	46.60	27.8	62.37	4.20
28.7	35.11	44.07	28.7	45.36	33.26	28.7	26.02	22.80	28.8	45.17	46.52	28.8	62.55	4.22
29.7	35.26	44.36	29.7	45.86	33.35	29.7	26.24	22.98	29.8	45.35	46.46	29.8	62.70	4.23
30.6	35.41	44.63	30.7	46.37	33.48	30.7	26.44	23.15	30.8	45.52	46.41	30.8	62.86	4.24
31.6	35.55	44.88	31.7	46.86	33.62	31.7	26.65	23.32	31.8	45.70	46.37	31.8	63.00	4.24
8.59	-8.53		23.16	+23.14		9.91	-9.86		7.33	+7.27		6.24	-6.16	
14 ^h 14 ^m 23 ^s .592			15 ^h 1 ^m 45 ^s .970			15 ^h 25 ^m 17 ^s .036			16 ^h 53 ^m 48 ^s .037			17 ^h 17 ^m 1 ^s .936		
-83° 19'	1' 42"		+87° 31'	46' 68"		-84° 12'	45' 34"		+82° 9'	58' 64"		-80° 47'	29' 50"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Feb.	17 56	+86 36	Feb.	18 9	-87 39	Feb.	18 54	+89 1	Feb.	19 35	-89 12	Feb.	20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
0.9	45.75	46.71	0.9	22.29	27.43	0.9	17.05	33.59	0.9	17.93	27.18	1.0	8.38	58.69
1.9	45.98	46.40	1.9	22.77	27.23	1.9	17.50	33.25	1.9	18.89	26.90	2.0	8.37	58.32
2.9	46.22	46.11	2.9	23.24	27.03	2.9	18.03	32.92	2.9	19.79	26.62	2.9	8.35	57.95
3.9	46.49	45.83	3.9	23.67	26.84	3.9	18.66	32.59	3.9	20.62	26.33	3.9	8.35	57.59
4.9	46.76	45.57	4.9	24.11	26.62	4.9	19.34	32.29	4.9	21.44	26.01	4.9	8.36	57.23
5.9	47.04	45.33	5.9	24.56	26.39	5.9	20.05	32.01	5.9	22.21	25.70	5.9	8.37	56.89
6.9	47.32	45.12	6.9	25.02	26.15	6.9	20.76	31.74	6.9	23.07	25.37	6.9	8.39	56.56
7.9	47.57	44.92	7.9	25.53	25.90	7.9	21.42	31.50	7.9	24.01	25.03	7.9	8.41	56.25
8.9	47.83	44.72	8.9	26.07	25.65	8.9	22.04	31.25	8.9	25.06	24.68	8.9	8.43	55.94
9.9	48.07	44.50	9.9	26.64	25.43	9.9	22.63	30.98	9.9	26.22	24.35	9.9	8.45	55.64
10.9	48.32	44.28	10.9	27.23	25.23	10.9	23.21	30.71	10.9	27.46	24.03	10.9	8.47	55.33
11.9	48.58	44.04	11.9	27.82	25.05	11.9	23.80	30.43	11.9	28.72	23.73	11.9	8.48	55.02
12.8	48.85	43.80	12.9	28.39	24.88	12.9	24.43	30.15	12.9	29.99	23.44	12.9	8.49	54.68
13.8	49.13	43.56	13.9	28.95	24.73	13.9	25.14	29.86	13.9	31.24	23.17	13.9	8.51	54.34
14.8	49.43	43.32	14.9	29.49	24.58	14.9	25.92	29.57	14.9	32.44	22.91	14.9	8.53	53.98
15.8	49.75	43.10	15.9	30.01	24.43	15.9	26.76	29.28	15.9	33.60	22.65	15.9	8.56	53.62
16.8	50.07	42.89	16.8	30.52	24.28	16.9	27.67	28.99	16.9	34.72	22.39	16.9	8.60	53.25
17.8	50.41	42.69	17.8	31.03	24.13	17.9	28.61	28.74	17.9	35.81	22.13	17.9	8.65	52.89
18.8	50.75	42.50	18.8	31.53	23.96	18.9	29.59	28.49	18.9	36.92	21.86	18.9	8.70	52.55
19.8	51.10	42.33	19.8	32.05	23.79	19.9	30.58	28.25	19.9	38.04	21.59	19.9	8.76	52.23
20.8	51.44	42.18	20.8	32.59	23.62	20.9	31.57	28.03	20.9	39.19	21.31	20.9	8.82	51.91
21.8	51.77	42.04	21.8	33.14	23.44	21.9	32.55	27.83	21.9	40.40	21.02	21.9	8.89	51.60
22.8	52.10	41.91	22.8	33.72	23.26	22.9	33.50	27.62	22.9	41.68	20.73	22.9	8.95	51.31
23.8	52.42	41.77	23.8	34.32	23.11	23.9	34.41	27.43	23.9	43.05	20.44	23.9	9.01	51.03
24.8	52.73	41.63	24.8	34.96	22.97	24.9	35.30	27.23	24.9	44.51	20.16	24.9	9.07	50.75
25.8	53.04	41.49	25.8	35.61	22.83	25.9	36.18	27.03	25.9	46.03	19.91	25.9	9.13	50.46
26.8	53.35	41.34	26.8	36.26	22.73	26.9	37.05	26.81	26.9	47.61	19.65	26.9	9.19	50.16
27.8	53.67	41.18	27.8	36.91	22.64	27.9	37.95	26.59	27.9	49.19	19.43	27.9	9.24	49.85
28.8	53.99	41.01	28.8	37.53	22.56	28.8	38.90	26.36	28.9	50.74	19.21	28.9	9.30	49.53
29.8	54.35	40.85	29.8	38.13	22.48	29.8	39.92	26.14	29.9	52.25	19.01	29.9	9.36	49.21
30.8	54.72	40.70	30.8	38.69	22.40	30.8	41.02	25.93	30.9	53.67	18.80	30.9	9.44	48.88
31.8	55.09	40.59	31.8	39.25	22.31	31.8	42.18	25.73	31.9	55.04	18.60	31.9	9.52	48.56
16.92	+16.89		24.46	-24.44		58.76	+58.75		72.19	-72.18		7.41	+7.35	
17 ^h 57 ^m	4° 32'6"		18 ^h 9 ^m	46° 1'186"		18 ^h 55 ^m	23° 3'393"		19 ^h 37 ^m	1° 7'735"		20 ^h 48 ^m	15° 3'385"	
+86° 36'	50'' 43		-87° 39'	48'' 39		+89° 1'	32'' 83		-89° 12'	41'' 41		+82° 14'	50'' 67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Feb.	21 39	-83 4	Feb.	22 16	-86 21	Feb.	22 38	-81 47	Feb.	23 27	+86 53	Feb.	23 47	-82 26
	s	"		s	"		s	"		s	"		s	"
1.0	2.41	28.23	1.1	55.24	41.72	1.1	5.23	15.67	1.1	35.76	13.80	1.1	26.83	61.58
2.0	2.43	27.90	2.1	55.21	41.38	2.1	5.21	15.34	2.1	35.43	13.57	2.1	26.75	61.29
3.0	2.44	27.57	3.1	55.16	41.05	3.1	5.17	15.02	3.1	35.11	13.30	3.1	26.66	61.01
4.0	2.43	27.25	4.1	55.10	40.72	4.1	5.13	14.71	4.1	34.83	13.03	4.1	26.58	60.73
5.0	2.43	26.91	5.1	55.02	40.39	5.1	5.08	14.40	5.1	34.58	12.76	5.1	26.49	60.46
6.0	2.42	26.55	6.1	54.94	40.03	6.1	5.03	14.07	6.1	34.34	12.48	6.1	26.38	60.19
7.0	2.42	26.18	7.0	54.86	39.66	7.1	4.98	13.71	7.1	34.14	12.23	7.1	26.27	59.90
8.0	2.42	25.80	8.0	54.79	39.29	8.1	4.94	13.35	8.1	33.94	11.98	8.1	26.17	59.58
9.0	2.43	25.41	9.0	54.74	38.89	9.1	4.90	12.97	9.1	33.74	11.75	9.1	26.08	59.24
10.0	2.46	25.02	10.0	54.72	38.48	10.1	4.89	12.59	10.1	33.51	11.51	10.1	26.00	58.88
11.0	2.51	24.63	11.0	54.72	38.07	11.1	4.88	12.21	11.1	33.28	11.27	11.1	25.92	58.52
12.0	2.56	24.25	12.0	54.73	37.69	12.1	4.87	11.83	12.1	33.05	11.03	12.1	25.86	58.18
13.0	2.61	23.88	13.0	54.76	37.31	13.0	4.87	11.45	13.1	32.81	10.75	13.1	25.80	57.83
14.0	2.67	23.54	14.0	54.79	36.95	14.0	4.86	11.10	14.1	32.56	10.47	14.1	25.75	57.50
15.0	2.72	23.20	15.0	54.82	36.61	15.0	4.86	10.76	15.1	32.32	10.16	15.1	25.69	57.17
15.9	2.76	22.86	16.0	54.83	36.27	16.0	4.86	10.42	16.1	32.10	9.85	16.1	25.63	56.85
16.9	2.80	22.53	17.0	54.84	35.92	17.0	4.85	10.09	17.1	31.91	9.53	17.1	25.56	56.54
17.9	2.84	22.20	18.0	54.85	35.58	18.0	4.84	9.76	18.1	31.73	9.21	18.1	25.50	56.23
18.9	2.87	21.87	19.0	54.84	35.22	19.0	4.83	9.41	19.1	31.56	8.88	19.1	25.43	55.92
19.9	2.90	21.51	20.0	54.84	34.86	20.0	4.81	9.06	20.1	31.41	8.56	20.1	25.36	55.60
20.9	2.94	21.15	21.0	54.85	34.49	21.0	4.79	8.70	21.1	31.28	8.24	21.1	25.30	55.27
21.9	2.98	20.79	22.0	54.86	34.12	22.0	4.78	8.33	22.1	31.17	7.94	22.1	25.23	54.90
22.9	3.03	20.41	23.0	54.89	33.73	23.0	4.78	7.96	23.1	31.06	7.64	23.1	25.17	54.55
23.9	3.10	20.04	24.0	54.92	33.34	24.0	4.78	7.57	24.0	30.95	7.35	24.1	25.11	54.18
24.9	3.16	19.65	24.9	54.98	32.93	25.0	4.79	7.16	25.0	30.84	7.07	25.1	25.06	53.79
25.9	3.25	19.27	25.9	55.07	32.52	26.0	4.83	6.77	26.0	30.71	6.79	26.1	25.02	53.40
26.9	3.34	18.89	26.9	55.17	32.11	27.0	4.87	6.38	27.0	30.58	6.51	27.1	24.99	53.01
27.9	3.44	18.55	27.9	55.30	31.73	28.0	4.91	6.00	28.0	30.44	6.21	28.1	24.98	52.63
28.9	3.54	18.21	28.9	55.41	31.35	29.0	4.95	5.63	29.0	30.30	5.89	29.0	24.96	52.26
29.9	3.63	17.88	29.9	55.52	31.01	30.0	4.98	5.27	30.0	30.17	5.56	30.0	24.95	51.89
30.9	3.72	17.56	30.9	55.63	30.67	30.9	5.01	4.93	31.0	30.06	5.22	31.0	24.92	51.55
31.9	3.80	17.24	31.9	55.72	30.33	31.9	5.02	4.59	32.0	29.97	4.87	32.0	24.89	51.21
8.29	-8.23		15.75	-15.72		7.00	-6.93		18.41	+18.38		7.61	-7.54	
21 ^h 39 ^m	16°.433		22 ^h 17 ^m	21°.969		22 ^h 38 ^m	16°.769		23 ^h 27 ^m	42°.388		23 ^h 47 ^m	38°.028	
-83° 4'	28''.91		-86° 21'	38''.42		-81° 47'	9''.68		+86° 52'	58''.09		-82° 26'	48''.40	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 0 57	° ' +85 50	Mar.	h m 1 32	° ' +85 53	Mar.	h m 1 41	° ' -85 9	Mar.	h m 4 11	° ' +85 21	Mar.	h m 5 37	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.1	50.32	52.91	0.1	57.89	46.68	0.1	23.18	48.83	0.2	52.86	17.30	0.3	12.86	51.73
1.1	50.11	52.67	1.1	56.96	46.48	1.1	23.03	48.51	1.2	52.58	17.31	1.3	12.63	51.86
2.1	49.91	52.40	2.1	56.05	46.25	2.1	22.87	48.22	2.2	52.30	17.31	2.3	12.38	51.97
3.1	49.71	52.11	3.1	55.17	46.01	3.1	22.70	47.93	3.2	52.01	17.28	3.3	12.11	52.07
4.1	49.53	51.81	4.1	54.35	45.73	4.1	22.53	47.65	4.2	51.72	17.22	4.3	11.84	52.13
5.1	49.38	51.51	5.1	53.61	45.46	5.1	22.34	47.38	5.2	51.44	17.14	5.3	11.56	52.19
6.1	49.25	51.21	6.1	52.95	45.18	6.1	22.14	47.10	6.2	51.19	17.05	6.3	11.31	52.22
7.1	49.13	50.92	7.1	52.37	44.91	7.1	21.95	46.81	7.2	50.94	16.96	7.3	11.06	52.25
8.1	49.03	50.63	8.1	51.81	44.67	8.1	21.75	46.49	8.2	50.71	16.86	8.3	10.83	52.26
9.1	48.92	50.36	9.1	51.26	44.42	9.1	21.56	46.16	9.2	50.50	16.78	9.3	10.61	52.27
10.1	48.81	50.10	10.1	50.67	44.19	10.1	21.37	45.81	10.2	50.27	16.72	10.3	10.39	52.31
11.1	48.68	49.84	11.1	50.06	43.96	11.1	21.22	45.46	11.2	50.05	16.65	11.3	10.17	52.35
12.1	48.55	49.58	12.1	49.40	43.72	12.1	21.07	45.11	12.2	49.81	16.59	12.3	9.94	52.40
13.1	48.41	49.30	13.1	48.71	43.46	13.1	20.94	44.77	13.2	49.55	16.51	13.3	9.70	52.45
14.1	48.27	49.01	14.1	48.02	43.19	14.1	20.81	44.44	14.2	49.28	16.43	14.3	9.43	52.50
15.1	48.13	48.69	15.1	47.35	42.90	15.1	20.68	44.11	15.2	49.02	16.34	15.3	9.16	52.54
16.1	48.01	48.37	16.1	46.71	42.59	16.1	20.56	43.79	16.2	48.74	16.24	16.3	8.87	52.54
17.1	47.90	48.04	17.1	46.11	42.27	17.1	20.43	43.47	17.2	48.47	16.10	17.3	8.59	52.55
18.1	47.80	47.70	18.1	45.57	41.95	18.1	20.30	43.16	18.2	48.20	15.95	18.2	8.31	52.52
19.1	47.71	47.36	19.1	45.09	41.63	19.1	20.17	42.86	19.2	47.95	15.80	19.2	8.04	52.49
20.0	47.65	47.03	20.1	44.66	41.31	20.1	20.03	42.55	20.2	47.70	15.62	20.2	7.77	52.45
21.0	47.60	46.71	21.1	44.28	40.99	21.1	19.88	42.22	21.2	47.47	15.44	21.2	7.52	52.39
22.0	47.55	46.39	22.1	43.95	40.70	22.1	19.74	41.88	22.2	47.25	15.26	22.2	7.28	52.32
23.0	47.52	46.08	23.1	43.63	40.41	23.1	19.60	41.52	23.2	47.05	15.09	23.2	7.05	52.26
24.0	47.48	45.79	24.1	43.33	40.12	24.1	19.46	41.16	24.2	46.84	14.94	24.2	6.82	52.20
25.0	47.45	45.49	25.1	43.02	39.84	25.1	19.35	40.78	25.2	46.65	14.78	25.2	6.60	52.15
26.0	47.41	45.20	26.1	42.67	39.57	26.1	19.24	40.40	26.2	46.45	14.63	26.2	6.37	52.10
27.0	47.36	44.91	27.1	42.30	39.29	27.1	19.16	40.01	27.2	46.23	14.49	27.2	6.15	52.06
28.0	47.29	44.62	28.1	41.91	39.01	28.1	19.08	39.63	28.2	46.01	14.35	28.2	5.91	52.03
29.0	47.23	44.30	29.0	41.51	38.70	29.1	19.01	39.25	29.2	45.78	14.20	29.2	5.67	52.00
30.0	47.18	43.97	30.0	41.13	38.39	30.0	18.95	38.90	30.2	45.55	14.03	30.2	5.40	51.95
31.0	47.13	43.63	31.0	40.81	38.06	31.0	18.87	38.56	31.2	45.32	13.84	31.2	5.13	51.86
13.81	+13.77		51.87	+51.86		11.86	-11.82		12.35	+12.31		11.86	+11.82	
0 ^h 57 ^m	55°.489		1 ^h 33 ^m	11°.898		1 ^h 41 ^m	39°.995		4 ^h 11 ^m	48°.583		5 ^h 37 ^m	5°.478	
+85° 50'	41''.77		+88° 53'	34''.33		-85° 9'	32''.70		+85° 21'	5''.69		+85° 9'	42''.71	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			5 Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelopardalis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m 5 44	° ' -84 50	Mar.	h m 6 46	° ' -80 44	Mar.	h m 7 5	° ' +87 10	Mar.	h m 7 14	° ' -86 55	Mar.	h m 7 15	° ' +82 33
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	67.25	6.05	0.3	33.32	27.90	0.4	14.94	26.94	0.4	34.40	9.39	0.4	5.71	55.60
1.3	66.97	6.09	1.3	33.18	28.05	1.4	14.62	27.17	1.4	33.99	9.57	1.4	5.60	55.84
2.3	66.70	6.13	2.3	33.04	28.19	2.4	14.27	27.40	2.4	33.61	9.75	2.4	5.47	56.08
3.3	66.44	6.18	3.3	32.90	28.34	3.3	13.90	27.61	3.4	33.22	9.93	3.4	5.33	56.31
4.3	66.18	6.23	4.3	32.76	28.51	4.3	13.51	27.81	4.4	32.85	10.12	4.4	5.19	56.51
5.3	65.92	6.31	5.3	32.63	28.69	5.3	13.10	27.99	5.3	32.47	10.33	5.4	5.04	56.69
6.3	65.66	6.39	6.3	32.50	28.87	6.3	12.71	28.13	6.3	32.09	10.55	6.3	4.89	56.84
7.3	65.38	6.48	7.3	32.36	29.05	7.3	12.32	28.27	7.3	31.68	10.78	7.3	4.76	56.99
8.3	65.09	6.55	8.3	32.22	29.22	8.3	11.97	28.40	8.3	31.27	11.00	8.3	4.64	57.13
9.3	64.79	6.61	9.3	32.08	29.37	9.3	11.64	28.53	9.3	30.82	11.20	9.3	4.51	57.26
10.3	64.49	6.65	10.3	31.92	29.51	10.3	11.31	28.67	10.3	30.37	11.40	10.3	4.39	57.41
11.3	64.19	6.66	11.3	31.76	29.62	11.3	10.98	28.82	11.3	29.91	11.56	11.3	4.27	57.57
12.3	63.90	6.66	12.3	31.61	29.73	12.3	10.62	28.99	12.3	29.45	11.71	12.3	4.15	57.74
13.3	63.63	6.65	13.3	31.46	29.83	13.3	10.27	29.16	13.3	29.01	11.85	13.3	4.02	57.92
14.3	63.35	6.63	14.3	31.31	29.91	14.3	9.85	29.31	14.3	28.58	11.99	14.3	3.88	58.10
15.3	63.08	6.62	15.3	31.16	29.99	15.3	9.43	29.47	15.3	28.15	12.11	15.3	3.72	58.26
16.3	62.81	6.60	16.3	31.02	30.07	16.3	9.00	29.61	16.3	27.73	12.23	16.3	3.55	58.41
17.3	62.55	6.58	17.3	30.88	30.16	17.3	8.55	29.74	17.3	27.32	12.35	17.3	3.38	58.56
18.3	62.29	6.58	18.3	30.74	30.25	18.3	8.09	29.84	18.3	26.91	12.48	18.3	3.21	58.69
19.2	62.03	6.58	19.3	30.60	30.34	19.3	7.63	29.94	19.3	26.49	12.62	19.3	3.04	58.79
20.2	61.76	6.58	20.3	30.46	30.44	20.3	7.19	30.03	20.3	26.08	12.77	20.3	2.87	58.88
21.2	61.47	6.59	21.3	30.30	30.54	21.3	6.75	30.09	21.3	25.65	12.91	21.3	2.72	58.97
22.2	61.20	6.59	22.3	30.15	30.63	22.3	6.33	30.15	22.3	25.20	13.05	22.3	2.56	59.03
23.2	60.91	6.58	23.3	30.00	30.73	23.3	5.92	30.20	23.3	24.75	13.19	23.3	2.41	59.09
24.2	60.63	6.54	24.3	29.85	30.81	24.3	5.54	30.26	24.3	24.29	13.33	24.3	2.27	59.16
25.2	60.33	6.50	25.3	29.67	30.87	25.3	5.16	30.33	25.3	23.81	13.43	25.3	2.13	59.24
26.2	60.03	6.44	26.3	29.52	30.91	26.3	4.78	30.41	26.3	23.32	13.52	26.3	1.99	59.33
27.2	59.74	6.36	27.3	29.36	30.92	27.3	4.39	30.49	27.3	22.83	13.58	27.3	1.85	59.42
28.2	59.46	6.26	28.3	29.21	30.93	28.3	3.99	30.57	28.3	22.34	13.64	28.3	1.71	59.52
29.2	59.19	6.15	29.3	29.06	30.93	29.3	3.57	30.66	29.3	21.87	13.69	29.3	1.54	59.62
30.2	58.94	6.05	30.3	28.90	30.93	30.3	3.13	30.72	30.3	21.43	13.74	30.3	1.37	59.69
31.2	58.69	5.96	31.3	28.75	30.94	31.3	2.67	30.77	31.3	21.00	13.79	31.3	1.20	59.75
11.11	-11.06		6.22	-6.13		20.29	+20.26		18.61	-18.58		7.73	+7.66	
5 ^h 45 ^m	4° 7'00"		6 ^h 46 ^m	28° 8'50"		7 ^h 4 ^m	58° 5'49"		7 ^h 14 ^m	18° 1'18"		7 ^h 14 ^m	59° 0'83"	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Mar.	8 22	+88 51	Mar.	9 8	-85 21	Mar.	9 26	+81 40	Mar.	9 36	-80 35	Mar.	10 21	+82 56
	s	"		s	"		s	"		s	"		s	"
0.4	26.32	53.32	0.4	27.53	40.54	0.5	20.69	3.97	0.5	22.52	57.07	0.5	57.06	58.68
1.4	25.83	53.62	1.4	27.37	40.86	1.5	20.66	4.30	1.5	22.46	57.41	1.5	57.07	59.01
2.4	25.25	53.92	2.4	27.20	41.17	2.4	20.62	4.63	2.5	22.40	57.74	2.5	57.08	59.34
3.4	24.61	54.21	3.4	27.06	41.48	3.4	20.58	4.96	3.5	22.34	58.07	3.5	57.07	59.69
4.4	23.89	54.49	4.4	26.92	41.80	4.4	20.53	5.28	4.4	22.28	58.41	4.5	57.04	60.03
5.4	23.15	54.75	5.4	26.78	42.12	5.4	20.46	5.58	5.4	22.22	58.76	5.5	57.01	60.37
6.4	22.39	54.99	6.4	26.65	42.47	6.4	20.39	5.86	6.4	22.17	59.12	6.5	56.97	60.68
7.4	21.65	55.22	7.4	26.50	42.83	7.4	20.33	6.12	7.4	22.13	59.49	7.5	56.93	60.97
8.4	20.95	55.43	8.4	26.33	43.19	8.4	20.28	6.38	8.4	22.08	59.87	8.5	56.89	61.25
9.4	20.30	55.64	9.4	26.16	43.55	9.4	20.23	6.64	9.4	22.01	60.24	9.5	56.88	61.53
10.4	19.67	55.86	10.4	25.98	43.89	10.4	20.18	6.90	10.4	21.94	60.61	10.5	56.86	61.81
11.4	19.04	56.09	11.4	25.78	44.21	11.4	20.14	7.16	11.4	21.86	60.96	11.5	56.84	62.10
12.4	18.40	56.33	12.4	25.58	44.51	12.4	20.09	7.44	12.4	21.78	61.30	12.5	56.82	62.41
13.4	17.70	56.60	13.4	25.36	44 80	13.4	20.03	7.74	13.4	21.69	61.62	13.5	56.79	62.73
14.4	16.94	56.84	14.4	25.16	45.09	14.4	19.96	8.03	14.4	21.60	61.92	14.5	56.75	63.06
15.4	16.12	57.09	15.4	24.97	45.36	15.4	19.88	8.33	15.4	21.52	62.21	15.5	56.70	63.40
16.4	15.25	57.33	16.4	24.77	45.63	16.4	19.80	8.63	16.4	21.44	62.50	16.4	56.65	63.74
17.4	14.34	57.56	17.4	24.58	45.89	17.4	19.71	8.93	17.4	21.36	62.79	17.4	56.59	64.07
18.4	13.40	57.78	18.4	24.39	46.16	18.4	19.62	9.21	18.4	21.28	63.10	18.4	56.51	64.39
19.4	12.43	57.97	19.4	24.20	46.44	19.4	19.52	9.48	19.4	21.21	63.41	19.4	56.43	64.70
20.4	11.47	58.17	20.4	24.02	46.73	20.4	19.42	9.73	20.4	21.13	63.72	20.4	56.35	65.01
21.3	10.52	58.34	21.4	23.83	47.02	21.4	19.32	9.97	21.4	21.05	64.04	21.4	56.27	65.30
22.3	9.59	58.49	22.4	23.62	47.32	22.4	19.22	10.20	22.4	20.97	64.36	22.4	56.19	65.58
23.3	8.69	58.64	23.4	23.40	47.62	23.4	19.13	10.41	23.4	20.89	64.68	23.4	56.11	65.83
24.3	7.81	58.79	24.4	23.18	47.92	24.4	19.04	10.63	24.4	20.80	65.01	24.4	56.03	66.09
25.3	6.98	58.95	25.4	22.95	48.20	25.4	18.96	10.85	25.4	20.71	65.32	25.4	55.97	66.35
26.3	6.16	59.11	26.4	22.71	48.47	26.4	18.88	11.07	26.4	20.61	65.61	26.4	55.91	66.61
27.3	5.34	59.29	27.4	22.45	48.71	27.4	18.80	11.30	27.4	20.50	65.90	27.4	55.85	66.89
28.3	4.48	59.47	28.4	22.20	48.94	28.4	18.71	11.53	28.4	20.38	66.17	28.4	55.78	67.17
29.3	3.57	59.65	29.4	21.95	49.16	29.4	18.62	11.78	29.4	20.27	66.41	29.4	55.70	67.46
30.3	2.58	59.82	30.4	21.71	49.37	30.4	18.51	12.03	30.4	20.17	66.65	30.4	55.61	67.75
31.3	1.54	59.97	31.4	21.48	49.59	31.4	18.38	12.27	31.4	20.07	66.90	31.4	55.50	68.04
50.52	+50.51		12.37	-12.33		6.90	+6.83		6.12	-6.04		8.15	+8.09	
8 ^h 21 ^m	41 ^s .998		9 ^h 8 ^m	8 ^s .703		9 ^h 26 ^m	14 ^s .295		9 ^h 36 ^m	12 ^s .346		10 ^h 21 ^m	50 ^s .081	
+88° 51'	51''.95		-85° 21'	25''.35		+81° 40'	7''.28		-80° 35'	44''.11		+82° 57'	4''.81	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Mar.	11 0	-84 10	Mar.	12 14	+88 7	Mar.	12 47	-84 42	Mar.	12 48	+83 49	Mar.	13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
0.5	10.92	50.01	0.6	47.92	25.93	0.6	1.52	10.98	0.6	37.64	40.88	0.6	28.87	20.51
1.5	10.90	50.39	1.6	48.29	26.22	1.6	1.63	11.35	1.6	37.79	41.14	1.6	29.04	20.84
2.5	10.88	50.76	2.6	48.63	26.53	2.6	1.73	11.68	2.6	37.92	41.42	2.6	29.20	21.16
3.5	10.87	51.11	3.6	48.94	26.85	3.6	1.83	12.01	3.6	38.05	41.71	3.6	29.37	21.46
4.5	10.86	51.47	4.6	49.20	27.18	4.6	1.95	12.34	4.6	38.15	42.01	4.6	29.55	21.75
5.5	10.86	51.84	5.6	49.40	27.51	5.6	2.08	12.67	5.6	38.24	42.31	5.6	29.73	22.04
6.5	10.87	52.22	6.6	49.57	27.82	6.6	2.21	13.01	6.6	38.32	42.61	6.6	29.93	22.34
7.5	10.89	52.62	7.5	49.72	28.12	7.6	2.35	13.38	7.6	38.40	42.89	7.6	30.13	22.66
8.5	10.89	53.04	8.5	49.87	28.40	8.6	2.49	13.75	8.6	38.48	43.16	8.6	30.34	22.99
9.5	10.88	53.47	9.5	50.04	28.68	9.6	2.60	14.14	9.6	38.56	43.42	9.6	30.54	23.35
10.5	10.85	53.88	10.5	50.22	28.95	10.6	2.71	14.54	10.6	38.65	43.68	10.6	30.72	23.71
11.5	10.81	54.29	11.5	50.44	29.23	11.6	2.80	14.93	11.6	38.75	43.94	11.6	30.88	24.09
12.5	10.76	54.67	12.5	50.66	29.54	12.6	2.88	15.31	12.6	38.84	44.21	12.6	31.03	24.46
13.5	10.71	55.05	13.5	50.86	29.85	13.6	2.94	15.69	13.6	38.94	44.50	13.6	31.16	24.80
14.5	10.65	55.41	14.5	51.06	30.18	14.6	3.01	16.05	14.6	39.03	44.82	14.6	31.28	25.15
15.5	10.60	55.77	15.5	51.22	30.52	15.6	3.07	16.39	15.6	39.11	45.15	15.6	31.40	25.49
16.5	10.54	56.11	16.5	51.37	30.87	16.5	3.13	16.74	16.5	39.18	45.47	16.6	31.52	25.81
17.5	10.49	56.45	17.5	51.47	31.22	17.5	3.19	17.09	17.5	39.24	45.80	17.6	31.64	26.13
18.5	10.44	56.79	18.5	51.54	31.57	18.5	3.26	17.43	18.5	39.30	46.14	18.6	31.77	26.45
19.5	10.39	57.15	19.5	51.59	31.91	19.5	3.33	17.80	19.5	39.35	46.48	19.6	31.90	26.77
20.5	10.34	57.51	20.5	51.60	32.25	20.5	3.41	18.15	20.5	39.38	46.81	20.6	32.04	27.10
21.5	10.30	57.88	21.5	51.59	32.58	21.5	3.49	18.51	21.5	39.41	47.13	21.6	32.18	27.44
22.5	10.26	58.26	22.5	51.57	32.90	22.5	3.57	18.87	22.5	39.43	47.46	22.6	32.32	27.80
23.5	10.21	58.65	23.5	51.56	33.22	23.5	3.63	19.26	23.5	39.46	47.76	23.6	32.45	28.16
24.5	10.15	59.04	24.5	51.55	33.51	24.5	3.70	19.67	24.5	39.50	48.05	24.6	32.58	28.53
25.5	10.07	59.43	25.5	51.55	33.80	25.5	3.76	20.08	25.5	39.53	48.34	25.6	32.71	28.92
26.4	9.98	59.81	26.5	51.58	34.09	26.5	3.79	20.48	26.5	39.57	48.63	26.5	32.81	29.31
27.4	9.88	60.18	27.5	51.61	34.40	27.5	3.82	20.87	27.5	39.62	48.94	27.5	32.90	29.70
28.4	9.77	60.54	28.5	51.64	34.72	28.5	3.83	21.26	28.5	39.66	49.25	28.5	32.97	30.08
29.4	9.67	60.88	29.5	51.65	35.04	29.5	3.83	21.64	29.5	39.70	49.57	29.5	33.02	30.46
30.4	9.57	61.20	30.5	51.63	35.38	30.5	3.84	22.01	30.5	39.71	49.90	30.5	33.08	30.80
31.4	9.47	61.52	31.5	51.56	35.73	31.5	3.85	22.34	31.5	39.73	50.25	31.5	33.16	31.15
9.86	-9.81		30.57	+30.55		10.84	-10.79		9.30	+9.25		12.44	-12.40	
10 ^h 59 ^m	53 ^s .036		12 ^h 14 ^m	30 ^s .802		12 ^h 46 ^m	43 ^s .161		12 ^h 48 ^m	33 ^s .111		13 ^h 28 ^m	9 ^s .628	
-84° 10'	46''.79		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° '	Mar.	h m	° '	Mar.	h m	° '	Mar.	h m	° '	Mar.	h m	° '
	14 14	-83 18		15 1	+87 31		15 25	-84 12		16 53	+82 9		17 17	-80 47
	s	"		s	"		s	"		s	"		s	"
0.7	35.11	44.07	0.7	45.36	33.26	0.7	26.02	22.80	0.8	45.17	46.52	0.8	2.55	4.22
1.7	35.26	44.36	1.7	45.86	33.35	1.7	26.24	22.98	1.8	45.35	46.46	1.8	2.70	4.23
2.6	35.41	44.63	2.7	46.37	33.48	2.7	26.44	23.15	2.8	45.52	46.41	2.8	2.86	4.24
3.6	35.55	44.88	3.7	46.86	33.62	3.7	26.65	23.32	3.8	45.70	46.37	3.8	3.00	4.24
4.6	35.70	45.13	4.7	47.34	33.79	4.7	26.87	23.47	4.7	45.88	46.37	4.8	3.15	4.21
5.6	35.87	45.37	5.7	47.80	33.96	5.7	27.10	23.62	5.7	46.04	46.39	5.8	3.30	4.18
6.6	36.04	45.61	6.7	48.23	34.14	6.7	27.34	23.77	6.7	46.20	46.42	6.8	3.48	4.17
7.6	36.22	45.88	7.7	48.63	34.31	7.7	27.59	23.94	7.7	46.35	46.45	7.8	3.66	4.15
8.6	36.40	46.16	8.7	49.01	34.48	8.7	27.84	24.12	8.7	46.50	46.49	8.8	3.83	4.13
9.6	36.57	46.47	9.7	49.39	34.63	9.7	28.09	24.31	9.7	46.65	46.50	9.8	4.01	4.15
10.6	36.74	46.79	10.7	49.79	34.78	10.7	28.34	24.54	10.7	46.81	46.51	10.7	4.20	4.19
11.6	36.89	47.11	11.7	50.21	34.93	11.7	28.57	24.77	11.7	46.96	46.51	11.7	4.37	4.24
12.6	37.04	47.44	12.7	50.64	35.08	12.7	28.79	25.01	12.7	47.14	46.51	12.7	4.55	4.29
13.6	37.17	47.76	13.7	51.09	35.26	13.7	28.99	25.25	13.7	47.30	46.52	13.7	4.70	4.36
14.6	37.29	48.07	14.6	51.54	35.44	14.7	29.19	25.47	14.7	47.47	46.55	14.7	4.86	4.43
15.6	37.41	48.37	15.6	51.98	35.64	15.7	29.39	25.70	15.7	47.64	46.58	15.7	5.01	4.49
16.6	37.53	48.65	16.6	52.41	35.86	16.7	29.57	25.90	16.7	47.81	46.64	16.7	5.15	4.55
17.6	37.65	48.94	17.6	52.83	36.09	17.7	29.76	26.11	17.7	47.98	46.72	17.7	5.30	4.60
18.6	37.77	49.22	18.6	53.22	36.32	18.7	29.96	26.32	18.7	48.15	46.81	18.7	5.44	4.65
19.6	37.90	49.50	19.6	53.61	36.56	19.7	30.16	26.52	19.7	48.32	46.91	19.7	5.59	4.69
20.6	38.03	49.78	20.6	53.96	36.81	20.6	30.36	26.73	20.7	48.47	47.01	20.7	5.76	4.74
21.6	38.16	50.10	21.6	54.30	37.05	21.6	30.56	26.95	21.7	48.62	47.14	21.7	5.93	4.79
22.6	38.29	50.40	22.6	54.62	37.30	22.6	30.78	27.17	22.7	48.77	47.26	22.7	6.09	4.84
23.6	38.43	50.73	23.6	54.93	37.54	23.6	31.00	27.42	23.7	48.91	47.38	23.7	6.26	4.90
24.6	38.57	51.06	24.6	55.23	37.77	24.6	31.22	27.68	24.7	49.06	47.49	24.7	6.42	4.99
25.6	38.70	51.43	25.6	55.54	37.99	25.6	31.42	27.95	25.7	49.20	47.59	25.7	6.61	5.08
26.6	38.81	51.79	26.6	55.97	38.21	26.6	31.62	28.23	26.7	49.35	47.68	26.7	6.78	5.20
27.6	38.92	52.15	27.6	56.20	38.43	27.6	31.81	28.53	27.7	49.50	47.77	27.7	6.95	5.33
28.6	39.01	52.51	28.6	56.54	38.66	28.6	31.99	28.82	28.7	49.65	47.87	28.7	7.11	5.47
29.6	39.10	52.85	29.6	56.89	38.90	29.6	32.14	29.11	29.7	49.80	48.00	29.7	7.26	5.61
30.6	39.18	53.18	30.6	57.22	39.16	30.6	32.30	29.38	30.7	49.96	48.13	30.7	7.39	5.74
31.6	39.27	53.50	31.6	57.54	39.44	31.6	32.47	29.64	31.7	50.11	48.29	31.7	7.52	5.84
8.59	-8.53		23.17	+23.15		9.91	-9.86		7.33	+7.27		6.24	-6.16	
14 ^h 14 ^m 23 ^s .592			15 ^h 1 ^m 45 ^s .970			15 ^h 25 ^m 17 ^s .036			16 ^h 53 ^m 48 ^s .037			17 ^h 17 ^m 1 ^s .936		
-83° 19' 1''.42			+87° 31' 46''.68			-84° 12' 45''.34			+82° 9' 58''.64			-80° 47' 29''.50		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "	Mar.	h m	° ' "
	17 56	+86 36		18 9	-87 39		18 54	+89 1		19 35	-89 12		20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
0.8	53.99	41.01	0.8	37.53	22.56	0.8	38.90	26.36	0.9	50.74	19.21	0.9	9.30	49.53
1.8	54.35	40.85	1.8	38.13	22.48	1.8	39.92	26.14	1.9	52.25	19.01	1.9	9.36	49.21
2.8	54.72	40.70	2.8	38.69	22.40	2.8	41.02	25.93	2.9	53.67	18.80	2.9	9.44	48.88
3.8	55.09	40.59	3.8	39.25	22.31	3.8	42.18	25.73	3.9	55.04	18.60	3.9	9.52	48.56
4.8	55.47	40.49	4.8	39.81	22.21	4.8	43.37	25.55	4.9	56.38	18.37	4.9	9.61	48.26
5.8	55.85	40.42	5.8	40.38	22.10	5.8	44.56	25.40	5.9	57.75	18.14	5.9	9.71	47.98
6.8	56.22	40.36	6.8	40.98	21.97	6.8	45.73	25.26	6.9	59.17	17.89	6.9	9.82	47.73
7.8	56.56	40.31	7.8	41.62	21.86	7.8	46.83	25.15	7.9	60.70	17.64	7.9	9.92	47.49
8.8	56.90	40.26	8.8	42.28	21.75	8.8	47.88	25.03	8.9	62.32	17.39	8.9	10.01	47.26
9.8	57.23	40.21	9.8	42.97	21.66	9.8	48.91	24.90	9.8	64.02	17.15	9.9	10.11	47.02
10.8	57.56	40.13	10.8	43.66	21.60	10.8	49.93	24.77	10.8	65.76	16.95	10.9	10.20	46.78
11.8	57.90	40.05	11.8	44.33	21.56	11.8	50.98	24.62	11.8	67.51	16.76	11.9	10.29	46.52
12.8	58.26	39.98	12.8	44.98	21.52	12.8	52.07	24.47	12.8	69.22	16.59	12.9	10.38	46.25
13.8	58.63	39.90	13.8	45.60	21.51	13.8	53.23	24.31	13.8	70.91	16.42	13.9	10.48	45.97
14.8	59.01	39.84	14.8	46.20	21.49	14.8	54.44	24.16	14.8	72.52	16.27	14.9	10.58	45.69
15.8	59.42	39.78	15.8	46.80	21.46	15.8	55.71	24.01	15.8	74.08	16.12	15.9	10.69	45.42
16.8	59.82	39.74	16.8	47.37	21.43	16.8	57.01	23.89	16.8	75.61	15.96	16.9	10.81	45.15
17.8	60.22	39.73	17.8	47.94	21.40	17.8	58.33	23.79	17.8	77.11	15.79	17.9	10.94	44.90
18.8	60.61	39.73	18.8	48.52	21.36	18.8	59.68	23.70	18.8	78.62	15.62	18.9	11.07	44.66
19.8	60.99	39.74	19.8	49.11	21.32	19.8	61.01	23.64	19.8	80.15	15.46	19.9	11.20	44.44
20.8	61.37	39.77	20.8	49.71	21.28	20.8	62.31	23.58	20.8	81.72	15.28	20.9	11.33	44.24
21.7	61.75	39.80	21.8	50.33	21.24	21.8	63.58	23.52	21.8	83.35	15.10	21.9	11.46	44.05
22.7	62.12	39.83	22.8	50.98	21.21	22.8	64.80	23.48	22.8	85.05	14.93	22.9	11.59	43.87
23.7	62.46	39.87	23.8	51.64	21.19	23.8	65.99	23.43	23.8	86.81	14.76	23.9	11.72	43.69
24.7	62.80	39.90	24.8	52.31	21.18	24.8	67.15	23.38	24.8	88.64	14.61	24.9	11.85	43.51
25.7	63.13	39.93	25.7	52.99	21.19	25.8	68.27	23.33	25.8	90.52	14.46	25.9	11.97	43.33
26.7	63.48	39.94	26.7	53.67	21.23	26.8	69.40	23.26	26.8	92.41	14.35	26.9	12.09	43.14
27.7	63.83	39.95	27.7	54.34	21.28	27.8	70.56	23.20	27.8	94.30	14.24	27.9	12.21	42.95
28.7	64.20	39.96	28.7	54.97	21.33	28.8	71.77	23.14	28.8	96.13	14.15	28.8	12.33	42.75
29.7	64.57	39.99	29.7	55.57	21.39	29.8	73.06	23.08	29.8	97.87	14.06	29.8	12.46	42.55
30.7	64.95	40.03	30.7	56.15	21.44	30.8	74.39	23.03	30.8	99.55	13.98	30.8	12.60	42.36
31.7	65.34	40.11	31.7	56.72	21.47	31.8	75.75	23.01	31.8	101.17	13.88	31.8	12.75	42.18
16.92	+16.89		24.45	-24.43		58.67	+58.66		72.03	-72.02		7.41	+7.34	
17 ^h 57 ^m 4 ^s .326			18 ^h 9 ^m 46 ^s .186			18 ^h 55 ^m 23 ^s .393			19 ^h 37 ^m 1 ^s .735			20 ^h 48 ^m 15 ^s .385		
+86° 36' 50".43			-87° 39' 48".39			+89° 1' 32".83			-89° 12' 41".41			+82° 14' 50".67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Mar. 21 39	-83 4		Mar. 22 16	-86 21		Mar. 22 38	-81 46		Mar. 23 27	+86 52		Mar. 23 47	-82 26	
	s			s			s			s			s	
0.9	3.54	18.21	0.9	55.41	31.35	1.0	4.95	65.63	1.0	30.30	65.89	1.0	24.96	52.26
1.9	3.63	17.88	1.9	55.52	31.01	2.0	4.98	65.27	2.0	30.17	65.56	2.0	24.95	51.89
2.9	3.72	17.56	2.9	55.63	30.67	2.9	5.01	64.93	3.0	30.06	65.22	3.0	24.92	51.55
3.9	3.80	17.24	3.9	55.72	30.33	3.9	5.02	64.59	4.0	29.97	64.87	4.0	24.89	51.21
4.9	3.87	16.91	4.9	55.79	29.98	4.9	5.04	64.23	5.0	29.92	64.52	5.0	24.86	50.87
5.9	3.94	16.57	5.9	55.85	29.61	5.9	5.05	63.87	6.0	29.89	64.19	6.0	24.82	50.50
6.9	4.01	16.20	6.9	55.93	29.23	6.9	5.08	63.49	7.0	29.88	63.87	7.0	24.78	50.13
7.9	4.10	15.83	7.9	56.01	28.83	7.9	5.11	63.08	8.0	29.89	63.58	8.0	24.75	49.75
8.9	4.19	15.46	8.9	56.13	28.43	8.9	5.15	62.68	9.0	29.89	63.28	9.0	24.73	49.33
9.9	4.30	15.09	9.9	56.26	28.01	9.9	5.19	62.29	10.0	29.88	63.00	10.0	24.72	48.91
10.9	4.43	14.72	10.9	56.41	27.66	10.9	5.24	61.90	11.0	29.85	62.70	11.0	24.72	48.51
11.9	4.56	14.39	11.9	56.59	27.28	11.9	5.31	61.51	12.0	29.82	62.39	12.0	24.72	48.12
12.9	4.69	14.05	12.9	56.77	26.91	12.9	5.38	61.14	13.0	29.77	62.06	13.0	24.73	47.73
13.9	4.81	13.74	13.9	56.95	26.57	13.9	5.44	60.80	14.0	29.72	61.74	14.0	24.75	47.36
14.9	4.93	13.45	14.9	57.11	26.23	14.9	5.51	60.45	14.9	29.70	61.39	15.0	24.76	47.00
15.9	5.04	13.16	15.9	57.26	25.90	15.9	5.57	60.12	15.9	29.69	61.04	16.0	24.76	46.64
16.9	5.15	12.87	16.9	57.41	25.57	16.9	5.62	59.78	16.9	29.70	60.68	17.0	24.76	46.29
17.9	5.26	12.56	17.9	57.56	25.25	17.9	5.67	59.45	17.9	29.74	60.32	18.0	24.76	45.94
18.9	5.36	12.25	18.9	57.70	24.92	18.9	5.71	59.12	18.9	29.80	59.97	19.0	24.76	45.58
19.9	5.46	11.94	19.9	57.84	24.59	19.9	5.76	58.78	19.9	29.88	59.63	19.9	24.76	45.22
20.9	5.57	11.64	20.9	57.98	24.25	20.9	5.82	58.42	20.9	29.97	59.30	20.9	24.76	44.86
21.9	5.68	11.32	21.9	58.13	23.89	21.9	5.88	58.06	21.9	30.07	58.98	21.9	24.76	44.48
22.9	5.81	10.99	22.9	58.31	23.53	22.9	5.94	57.69	22.9	30.17	58.68	22.9	24.77	44.09
23.9	5.94	10.66	23.9	58.49	23.17	23.9	6.01	57.30	23.9	30.27	58.39	23.9	24.79	43.68
24.9	6.08	10.33	24.9	58.70	22.80	24.9	6.09	56.92	24.9	30.37	58.10	24.9	24.82	43.27
25.9	6.24	10.01	25.9	58.94	22.46	25.9	6.18	56.55	25.9	30.45	57.82	25.9	24.86	42.86
26.9	6.40	9.72	26.9	59.17	22.12	26.9	6.28	56.19	26.9	30.51	57.53	26.9	24.90	42.47
27.9	6.56	9.45	27.9	59.42	21.79	27.9	6.38	55.85	27.9	30.57	57.22	27.9	24.95	42.08
28.9	6.72	9.16	28.9	59.67	21.47	28.9	6.48	55.52	28.9	30.65	56.91	28.9	25.00	41.70
29.9	6.88	8.90	29.9	59.91	21.17	29.9	6.57	55.20	29.9	30.73	56.59	29.9	25.06	41.33
30.9	7.03	8.65	30.9	60.13	20.87	30.9	6.66	54.89	30.9	30.85	56.27	30.9	25.10	40.98
31.9	7.16	8.39	31.9	60.34	20.57	31.9	6.74	54.58	31.9	30.98	55.94	31.9	25.13	40.64
8.29	-8.23		15.74	-15.71		7.00	-6.93		18.39	+18.37		7.61	-7.54	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Apr. 0 57	+85 50		Apr. 1 32	+88 53		Apr. 1 41	-85 9		Apr. 4 11	+85 21		Apr. 5 36	+85 9	
s	"		s	"		s	"		s	"		s	"	
0.0	47.13	43.63	0.0	40.81	38.06	0.0	18.87	38.56	0.2	45.32	13.84	0.2	65.13	51.86
1.0	47.12	43.29	1.0	40.58	37.72	1.0	18.79	38.23	1.1	45.10	13.62	1.2	64.87	51.76
2.0	47.13	42.96	2.0	40.43	37.37	2.0	18.70	37.88	2.1	44.90	13.39	2.2	64.63	51.62
3.0	47.17	42.63	3.0	40.37	37.04	3.0	18.59	37.52	3.1	44.72	13.16	3.2	64.40	51.48
4.0	47.21	42.31	4.0	40.36	36.71	4.0	18.49	37.16	4.1	44.55	12.92	4.2	64.19	51.34
5.0	47.26	42.01	5.0	40.36	36.42	5.0	18.40	36.78	5.1	44.40	12.69	5.2	63.99	51.19
6.0	47.31	41.72	6.0	40.36	36.13	6.0	18.31	36.39	6.1	44.26	12.48	6.2	63.79	51.06
6.9	47.34	41.43	7.0	40.31	35.86	7.0	18.25	35.98	7.1	44.11	12.28	7.2	63.59	50.93
7.9	47.37	41.15	8.0	40.23	35.57	8.0	18.19	35.58	8.1	43.94	12.07	8.2	63.40	50.83
8.9	47.39	40.87	9.0	40.11	35.29	9.0	18.15	35.19	9.1	43.77	11.87	9.2	63.18	50.72
9.9	47.40	40.57	10.0	39.98	34.97	10 0	18.12	34.80	10.1	43.59	11.65	10.2	62.96	50.61
10.9	47.41	40.25	11.0	39.87	34.66	11.0	18.11	34.43	11.1	43.41	11.43	11.2	62.72	50.48
11.9	47.44	39.92	12.0	39.78	34.33	12.0	18.08	34.06	12.1	43.22	11.20	12.2	62.49	50.35
12.9	47.48	39.59	13.0	39.75	33.99	13.0	18.05	33.72	13.1	43.03	10.96	13.2	62.25	50.21
13.9	47.52	39.26	14.0	39.76	33.64	14.0	18.03	33.37	14.1	42.85	10.69	14.2	62.01	50.04
14.9	47.60	38.93	15.0	39.83	33.29	15.0	18.00	33.03	15.1	42.69	10.42	15.2	61.78	49.87
15.9	47.68	38.60	15.9	39.95	32.95	16.0	17.97	32.69	16.1	42.54	10.14	16.2	61.56	49.67
16.9	47.78	38.28	16.9	40.12	32.61	17.0	17.94	32.33	17.1	42.40	9.86	17.2	61.36	49.46
17.9	47.88	37.96	17.9	40.35	32.28	17.9	17.90	31.96	18.1	42.27	9.57	18.2	61.17	49.24
18.9	48.00	37.66	18.9	40.61	31.96	18.9	17.86	31.59	19.1	42.16	9.29	19.2	60.99	49.03
19.9	48.13	37.38	19.9	40.88	31.66	19.9	17.83	31.22	20.1	42.06	9.01	20.2	60.82	48.83
20.9	48.24	37.11	20.9	41.15	31.37	20.9	17.82	30.83	21.1	41.97	8.75	21.2	60.65	48.64
21.9	48.35	36.85	21.9	41.40	31.09	21.9	17.82	30.42	22.1	41.87	8.50	22.2	60.50	48.44
22.9	48.45	36.60	22.9	41.64	30.83	22.9	17.83	30.02	23.1	41.78	8.26	23.1	60.34	48.26
23.9	48.55	36.35	23.9	41.83	30.56	23.9	17.86	29.61	24.1	41.67	8.02	24.1	60.17	48.08
24.9	48.64	36.08	24.9	41.99	30.27	24.9	17.89	29.23	25.1	41.55	7.77	25.1	60.00	47.91
25.9	48.74	35.80	25.9	42.16	29.96	25.9	17.93	28.84	26.1	41.42	7.51	26.1	59.81	47.73
26.9	48.84	35.51	26.9	42.39	29.65	26.9	17.97	28.46	27.1	41.30	7.24	27.1	59.61	47.53
27.9	48.96	35.21	27.9	42.69	29.33	27.9	18.00	28.14	28.1	41.20	6.95	28.1	59.42	47.30
28.9	49.10	34.91	28.9	43.07	29.01	28.9	18.02	27.80	29.1	41.10	6.63	29.1	59.24	47.06
29.9	49.28	34.62	29.9	43.53	28.69	29.9	18.03	27.46	30.1	41.03	6.31	30.1	59.10	46.78
30.9	49.47	34.35	30.9	44.07	28.40	30.9	18.04	27.11	31.1	40.98	5.99	31.1	58.96	46.51
13.80	+13.76		51.74	+51.73		11.85	-11.81		12.34	+12.30		11.86	+11.82	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Apr.	5 44	-84 50	Apr.	6 46	-80 44	Apr.	7 4	+87 10	Apr.	7 14	-86 55	Apr.	7 14	+82 33
	s	"		s	"		s	"		s	"		s	"
0.2	58.69	5.96	0.3	28.75	30.94	0.3	62.67	30.77	0.3	21.00	13.79	0.3	61.20	59.75
1.2	58.42	5.90	1.3	28.61	30.97	1.3	62.21	30.79	1.3	20.57	13.86	1.3	61.02	59.78
2.2	58.16	5.84	2.3	28.47	31.01	2.3	61.74	30.80	2.3	20.14	13.94	2.3	60.85	59.81
3.2	57.89	5.79	3.2	28.32	31.05	3.3	61.31	30.77	3.3	19.69	14.03	3.3	60.69	59.81
4.2	57.61	5.73	4.2	28.17	31.09	4.3	60.88	30.74	4.3	19.23	14.12	4.3	60.54	59.80
5.2	57.34	5.65	5.2	28.00	31.11	5.3	60.49	30.70	5.3	18.75	14.21	5.3	60.39	59.78
6.2	57.05	5.56	6.2	27.83	31.12	6.3	60.11	30.66	6.3	18.24	14.26	6.3	60.25	59.77
7.2	56.76	5.44	7.2	27.68	31.12	7.3	59.74	30.65	7.3	17.73	14.31	7.3	60.11	59.77
8.2	56.48	5.30	8.2	27.52	31.08	8.3	59.36	30.64	8.3	17.25	14.32	8.3	59.97	59.78
9.2	56.21	5.15	9.2	27.37	31.04	9.2	58.96	30.64	9.3	16.76	14.34	9.3	59.82	59.80
10.2	55.97	4.99	10.2	27.22	30.98	10.2	58.54	30.64	10.2	16.29	14.34	10.3	59.67	59.82
11.2	55.73	4.83	11.2	27.07	30.92	11.2	58.11	30.65	11.2	15.83	14.32	11.2	59.51	59.83
12.2	55.48	4.68	12.2	26.92	30.85	12.2	57.65	30.64	12.2	15.40	14.30	12.2	59.34	59.83
13.2	55.24	4.53	13.2	26.78	30.79	13.2	57.19	30.61	13.2	14.97	14.30	13.2	59.16	59.82
14.2	55.01	4.40	14.2	26.64	30.74	14.2	56.74	30.56	14.2	14.54	14.29	14.2	58.98	59.79
15.2	54.78	4.26	15.2	26.51	30.69	15.2	56.27	30.50	15.2	14.11	14.29	15.2	58.81	59.75
16.2	54.54	4.13	16.2	26.37	30.64	16.2	55.82	30.42	16.2	13.69	14.29	16.2	58.63	59.70
17.2	54.30	4.01	17.2	26.22	30.59	17.2	55.39	30.33	17.2	13.26	14.30	17.2	58.48	59.62
18.2	54.05	3.88	18.2	26.07	30.54	18.2	54.96	30.24	18.2	12.82	14.30	18.2	58.32	59.54
19.2	53.80	3.73	19.2	25.92	30.50	19.2	54.56	30.13	19.2	12.36	14.31	19.2	58.16	59.46
20.2	53.55	3.57	20.2	25.78	30.45	20.2	54.18	30.02	20.2	11.90	14.30	20.2	58.02	59.37
21.2	53.30	3.39	21.2	25.64	30.38	21.2	53.81	29.92	21.2	11.43	14.28	21.2	57.88	59.28
22.2	53.05	3.20	22.2	25.49	30.29	22.2	53.45	29.82	22.2	10.95	14.24	22.2	57.75	59.19
23.2	52.81	3.00	23.2	25.33	30.17	23.2	53.11	29.73	23.2	10.46	14.19	23.2	57.62	59.13
24.1	52.57	2.78	24.2	25.18	30.04	24.2	52.75	29.65	24.2	9.99	14.10	24.2	57.49	59.07
25.1	52.34	2.56	25.2	25.04	29.91	25.2	52.38	29.57	25.2	9.54	14.02	25.2	57.34	59.01
26.1	52.12	2.34	26.2	24.90	29.77	26.2	52.00	29.48	26.2	9.11	13.93	26.2	57.20	58.93
27.1	51.91	2.13	27.2	24.76	29.62	27.2	51.58	29.38	27.2	8.69	13.85	27.2	57.04	58.85
28.1	51.71	1.93	28.2	24.63	29.49	28.2	51.16	29.25	28.2	8.28	13.77	28.2	56.88	58.74
29.1	51.51	1.75	29.2	24.50	29.39	29.2	50.74	29.10	29.2	7.87	13.71	29.2	56.72	58.61
30.1	51.28	1.58	30.2	24.38	29.29	30.2	50.35	28.92	30.2	7.46	13.65	30.2	56.57	58.47
31.1	51.06	1.41	31.2	24.25	29.20	31.2	50.00	28.73	31.2	7.04	13.61	31.2	56.43	58.32
11.11	-11.06		6.22	-6.14		20.29	+20.27		18.62	-18.59		7.73	+7.66	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 5'49		7 ^h 14 ^m	18° 1'85		7 ^h 14 ^m	59° 0'83	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Apr. 8 21	+88 51		Apr. 9 8	-85 21		Apr. 9 26	+81 40		Apr. 9 36	-80 36		Apr. 10 21	+82 57	
s	"		s	"		s	"		s	"		s	"	
0.3 61.54	59.97	0.4	21.48	49.59	0.4	18.38	12.27	0.4	20.07	6.90	0.4	55.50	8.04	
1.3 60.47	60.10	1.4	21.25	49.82	1.4	18.26	12.47	1.4	19.97	7.16	1.4	55.38	8.32	
2.3 59.38	60.20	2.4	21.03	50.06	2.4	18.13	12.66	2.4	19.87	7.42	2.4	55.26	8.57	
3.3 58.30	60.30	3.3	20.81	50.31	3.4	18.01	12.84	3.4	19.78	7.70	3.4	55.14	8.80	
4.3 57.28	60.37	4.3	20.58	50.58	4.4	17.90	13.00	4.4	19.69	7.99	4.4	55.03	9.00	
5.3 56.30	60.44	5.3	20.33	50.83	5.4	17.79	13.15	5.4	19.58	8.28	5.4	54.92	9.20	
6.3 55.36	60.51	6.3	20.07	51.08	6.4	17.68	13.30	6.4	19.47	8.56	6.4	54.82	9.40	
7.3 54.45	60.59	7.3	19.79	51.31	7.4	17.58	13.45	7.4	19.35	8.82	7.4	54.73	9.60	
8.3 53.54	60.68	8.3	19.52	51.51	8.3	17.48	13.62	8.4	19.23	9.06	8.4	54.63	9.82	
9.3 52.59	60.77	9.3	19.25	51.70	9.3	17.37	13.80	9.4	19.11	9.29	9.4	54.53	10.05	
10.3 51.61	60.87	10.3	18.97	51.88	10.3	17.26	13.99	10.3	18.98	9.49	10.4	54.42	10.30	
11.3 50.57	60.97	11.3	18.70	52.04	11.3	17.14	14.18	11.3	18.85	9.68	11.4	54.30	10.55	
12.3 49.49	61.07	12.3	18.43	52.19	12.3	17.01	14.36	12.3	18.74	9.87	12.4	54.18	10.80	
13.3 48.37	61.16	13.3	18.18	52.34	13.3	16.87	14.54	13.3	18.62	10.05	13.4	54.04	11.04	
14.3 47.22	61.22	14.3	17.94	52.50	14.3	16.73	14.69	14.3	18.50	10.23	14.4	53.90	11.26	
15.3 46.06	61.27	15.3	17.70	52.67	15.3	16.59	14.84	15.3	18.39	10.42	15.4	53.75	11.47	
16.3 44.91	61.30	16.3	17.45	52.83	16.3	16.44	14.98	16.3	18.28	10.62	16.4	53.60	11.68	
17.3 43.78	61.31	17.3	17.20	53.01	17.3	16.30	15.08	17.3	18.17	10.82	17.4	53.45	11.88	
18.3 42.66	61.32	18.3	16.94	53.19	18.3	16.16	15.18	18.3	18.06	11.02	18.4	53.31	12.06	
19.3 41.58	61.32	19.3	16.68	53.36	19.3	16.02	15.28	19.3	17.95	11.23	19.4	53.16	12.21	
20.3 40.56	61.32	20.3	16.41	53.54	20.3	15.89	15.37	20.3	17.83	11.44	20.4	53.02	12.35	
21.3 39.57	61.31	21.3	16.13	53.70	21.3	15.77	15.45	21.3	17.70	11.65	21.4	52.89	12.49	
22.3 38.63	61.31	22.3	15.84	53.85	22.3	15.66	15.53	22.3	17.57	11.83	22.3	52.76	12.63	
23.3 37.69	61.32	23.3	15.54	53.98	23.3	15.55	15.62	23.3	17.43	11.99	23.3	52.64	12.78	
24.3 36.74	61.33	24.3	15.23	54.08	24.3	15.43	15.72	24.3	17.30	12.14	24.3	52.52	12.96	
25.3 35.75	61.33	25.3	14.94	54.19	25.3	15.30	15.82	25.3	17.16	12.28	25.3	52.39	13.13	
26.3 34.71	61.34	26.3	14.66	54.28	26.3	15.17	15.93	26.3	17.03	12.40	26.3	52.25	13.30	
27.2 33.62	61.34	27.3	14.38	54.36	27.3	15.03	16.03	27.3	16.90	12.51	27.3	52.10	13.47	
28.2 32.48	61.31	28.3	14.11	54.45	28.3	14.88	16.10	28.3	16.77	12.63	28.3	51.93	13.63	
29.2 31.34	61.27	29.3	13.85	54.55	29.3	14.72	16.16	29.3	16.65	12.76	29.3	51.76	13.77	
30.2 30.22	61.20	30.3	13.59	54.66	30.3	14.58	16.20	30.3	16.53	12.90	30.3	51.59	13.88	
31.2 29.15	61.12	31.3	13.33	54.79	31.3	14.43	16.22	31.3	16.41	13.06	31.3	51.43	13.98	
50.57	+50.56	12.37	-12.33	6.90	+6.83	6.12	-6.04	8.15	+8.09					
8 ^h 21 ^m	41 ^s .998	9 ^h 8 ^m	8 ^s .703	9 ^h 26 ^m	14 ^s .295	9 ^h 36 ^m	12 ^s .346	10 ^h 21 ^m	50 ^s .081					
+88° 51'	51''.95	-85° 21'	25''.35	+81° 40'	7''.28	-80° 35'	44''.11	+82° 57'	4''.81					

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Apr. 11 0		-84 11	Apr. 12 14		+88 7	Apr. 12 47		-84 42	Apr. 12 48		+83 49	Apr. 13 28		-85 23
	s	"		s	"		s	"		s	"		s	"
0.4	9.47	1.52	0.5	51.56	35.73	0.5	3.85	22.34	0.5	39.73	50.25	0.5	33.16	31.15
1.4	9.39	1.84	1.5	51.44	36.08	1.5	3.88	22.69	1.5	39.72	50.60	1.5	33.24	31.49
2.4	9.31	2.17	2.5	51.28	36.40	2.5	3.92	23.05	2.5	39.70	50.94	2.5	33.33	31.83
3.4	9.23	2.53	3.5	51.10	36.72	3.5	3.95	23.42	3.5	39.68	51.26	3.5	33.43	32.20
4.4	9.15	2.89	4.5	50.90	37.01	4.5	3.99	23.80	4.5	39.65	51.57	4.5	33.53	32.57
5.4	9.06	3.27	5.5	50.71	37.29	5.5	4.03	24.22	5.5	39.62	51.86	5.5	33.62	32.96
6.4	8.96	3.64	6.5	50.53	37.56	6.5	4.04	24.64	6.5	39.61	52.15	6.5	33.71	33.37
7.4	8.83	3.99	7.5	50.39	37.84	7.5	4.05	25.05	7.5	39.60	52.44	7.5	33.77	33.77
8.4	8.71	4.33	8.5	50.25	38.13	8.5	4.04	25.43	8.5	39.59	52.73	8.5	33.81	34.17
9.4	8.57	4.65	9.5	50.12	38.43	9.5	4.00	25.82	9.5	39.59	53.02	9.5	33.84	34.56
10.4	8.43	4.96	10.5	50.00	38.74	10.5	3.97	26.19	10.5	39.58	53.34	10.5	33.85	34.94
11.4	8.29	5.25	11.5	49.84	39.06	11.5	3.93	26.54	11.5	39.57	53.66	11.5	33.86	35.30
12.4	8.16	5.53	12.5	49.66	39.38	12.5	3.89	26.88	12.5	39.53	54.00	12.5	33.88	35.64
13.4	8.03	5.81	13.4	49.43	39.71	13.5	3.86	27.22	13.5	39.49	54.34	13.5	33.89	35.98
14.4	7.90	6.09	14.4	49.17	40.03	14.5	3.83	27.55	14.5	39.45	54.68	14.5	33.90	36.32
15.4	7.78	6.37	15.4	48.90	40.35	15.5	3.80	27.89	15.5	39.40	55.02	15.5	33.93	36.66
16.4	7.67	6.66	16.4	48.58	40.66	16.5	3.79	28.23	16.5	39.34	55.35	16.5	33.96	36.99
17.4	7.56	6.96	17.4	48.25	40.95	17.5	3.78	28.58	17.5	39.26	55.68	17.5	33.99	37.34
18.4	7.43	7.25	18.4	47.91	41.24	18.5	3.76	28.94	18.5	39.18	55.99	18.5	34.02	37.70
19.4	7.30	7.56	19.4	47.57	41.51	19.5	3.73	29.30	19.5	39.12	56.28	19.5	34.06	38.07
20.4	7.17	7.88	20.4	47.22	41.76	20.5	3.70	29.67	20.5	39.05	56.56	20.5	34.07	38.44
21.4	7.03	8.19	21.4	46.89	42.00	21.5	3.66	30.05	21.5	38.98	56.83	21.5	34.09	38.82
22.4	6.86	8.49	22.4	46.59	42.24	22.4	3.61	30.43	22.4	38.92	57.09	22.5	34.09	39.21
23.4	6.69	8.77	23.4	46.30	42.49	23.4	3.55	30.80	23.4	38.86	57.36	23.5	34.06	39.60
24.4	6.52	9.04	24.4	46.02	42.74	24.4	3.46	31.17	24.4	38.80	57.63	24.5	34.03	39.99
25.4	6.35	9.29	25.4	45.74	43.01	25.4	3.38	31.52	25.4	38.74	57.91	25.5	33.98	40.36
26.4	6.18	9.52	26.4	45.42	43.28	26.4	3.29	31.85	26.4	38.68	58.20	26.5	33.93	40.70
27.4	6.01	9.74	27.4	45.06	43.56	27.4	3.20	32.17	27.4	38.59	58.52	27.5	33.89	41.04
28.4	5.86	9.96	28.4	44.66	43.84	28.4	3.14	32.48	28.4	38.49	58.83	28.5	33.85	41.36
29.4	5.72	10.20	29.4	44.21	44.11	29.4	3.08	32.79	29.4	38.39	59.13	29.5	33.84	41.68
30.4	5.58	10.47	30.4	43.73	44.34	30.4	3.02	33.11	30.4	38.26	59.41	30.5	33.82	42.01
31.4	5.43	10.73	31.4	43.25	44.57	31.4	2.97	33.44	31.4	38.14	59.68	31.5	33.81	42.37
9.87	-9.82		30.61	+30.59		10.84	-10.80		9.31	+9.25		12.45	-12.41	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10'	46''.70		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m 14 14	° ' -83 18	Apr.	h m 15 1	° ' +87 31	Apr.	h m 15 25	° ' -84 12	Apr.	h m 16 53	° ' +82 9	Apr.	h m 17 17	° ' -80 47
	s "	"		s "	"		s "	"		s "	"		s "	"
0.6	39.27	53.50	0.6	57.54	39.44	0.6	32.47	29.64	0.7	50.11	48.29	0.7	7.52	5.84
1.6	39.37	53.81	1.6	57.82	39.74	1.6	32.64	29.89	1.7	50.25	48.47	1.7	7.66	5.95
2.6	39.46	54.12	2.6	58.07	40.04	2.6	32.81	30.14	2.7	50.39	48.66	2.7	7.82	6.04
3.6	39.56	54.44	3.6	58.29	40.34	3.6	32.99	30.39	3.7	50.53	48.87	3.7	7.97	6.13
4.6	39.69	54.78	4.6	58.48	40.64	4.6	33.19	30.66	4.7	50.66	49.06	4.7	8.14	6.23
5.6	39.80	55.14	5.6	58.66	40.92	5.6	33.39	30.94	5.7	50.78	49.25	5.7	8.32	6.36
6.6	39.91	55.51	6.6	58.85	41.17	6.6	33.59	31.26	6.7	50.90	49.43	6.7	8.49	6.50
7.5	40.00	55.89	7.6	59.07	41.42	7.6	33.77	31.57	7.7	51.02	49.61	7.7	8.66	6.65
8.5	40.08	56.27	8.6	59.29	41.67	8.6	33.93	31.89	8.7	51.15	49.77	8.7	8.81	6.82
9.5	40.14	56.65	9.6	59.52	41.94	9.6	34.07	32.21	9.7	51.28	49.94	9.7	8.95	7.00
10.5	40.20	57.01	10.6	59.76	42.21	10.6	34.20	32.53	10.6	51.41	50.11	10.7	9.10	7.19
11.5	40.25	57.35	11.6	60.00	42.50	11.6	34.33	32.84	11.6	51.55	50.30	11.7	9.23	7.37
12.5	40.30	57.69	12.6	60.23	42.81	12.6	34.46	33.13	12.6	51.68	50.51	12.7	9.36	7.55
13.5	40.35	58.02	13.6	60.43	43.11	13.6	34.58	33.41	13.6	51.81	50.74	13.7	9.48	7.72
14.5	40.40	58.34	14.6	60.62	43.46	14.6	34.70	33.70	14.6	51.94	50.97	14.7	9.60	7.87
15.5	40.45	58.67	15.6	60.77	43.79	15.6	34.83	33.98	15.6	52.07	51.22	15.7	9.73	8.02
16.5	40.51	58.99	16.6	60.92	44.13	16.6	34.97	34.26	16.6	52.17	51.47	16.6	9.86	8.18
17.5	40.57	59.32	17.6	61.03	44.46	17.6	35.10	34.54	17.6	52.28	51.74	17.6	10.00	8.33
18.5	40.63	59.66	18.6	61.13	44.79	18.6	35.24	34.83	18.6	52.39	52.01	18.6	10.14	8.48
19.5	40.70	60.01	19.6	61.22	45.11	19.6	35.39	35.14	19.6	52.50	52.26	19.6	10.29	8.66
20.5	40.76	60.38	20.5	61.28	45.41	20.6	35.53	35.46	20.6	52.59	52.50	20.6	10.43	8.83
21.5	40.81	60.75	21.5	61.36	45.70	21.6	35.67	35.79	21.6	52.69	52.75	21.6	10.58	9.02
22.5	40.86	61.14	22.5	61.44	45.98	22.6	35.80	36.13	22.6	52.78	53.00	22.6	10.72	9.25
23.5	40.90	61.52	23.5	61.53	46.26	23.6	35.91	36.50	23.6	52.88	53.23	23.6	10.86	9.48
24.5	40.92	61.90	24.5	61.64	46.54	24.6	36.01	36.85	24.6	52.98	53.45	24.6	10.99	9.72
25.5	40.93	62.27	25.5	61.74	46.84	25.6	36.10	37.19	25.6	53.08	53.68	25.6	11.12	9.96
26.5	40.94	62.61	26.5	61.84	47.16	26.5	36.18	37.53	26.6	53.18	53.93	26.6	11.23	10.19
27.5	40.95	62.94	27.5	61.92	47.48	27.5	36.26	37.85	27.6	53.28	54.20	27.6	11.34	10.40
28.5	40.96	63.27	28.5	61.97	47.82	28.5	36.35	38.14	28.6	53.37	54.49	28.6	11.45	10.60
29.5	40.99	63.59	29.5	61.99	48.16	29.5	36.44	38.43	29.6	53.45	54.81	29.6	11.56	10.79
30.5	41.02	63.92	30.5	61.97	48.51	30.5	36.54	38.74	30.6	53.53	55.13	30.6	11.68	10.98
31.5	41.06	64.26	31.5	61.92	48.84	31.5	36.66	39.05	31.6	53.59	55.44	31.6	11.81	11.18
8.59	-8.53		23.19	+23.17		9.91	-9.86		7.34	+7.27		6.24	-6.16	
14 ^h 14 ^m	23°.592		15 ^h 1 ^m	45°.970		15 ^h 25 ^m	17°.036		16 ^h 53 ^m	48°.037		17 ^h 17 ^m	1°.936	
-83° 19'	1'' 42		+87° 31'	46'' 68		-84° 12'	45'' 34		+82° 9'	58'' 64		-80° 47'	29'' 50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '	Apr.	h m	° '
	17 57	+86 36		18 9	-87 39		18 55	+89 1		19 36	-89 12		20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
0.7	5.34	40.11	0.7	56.72	21.47	0.8	15.75	23.01	0.8	41.17	13.88	0.8	12.75	42.18
1.7	5.72	40.19	1.7	57.31	21.49	1.8	17.11	23.01	1.8	42.78	13.77	1.8	12.90	42.04
2.7	6.08	40.30	2.7	57.90	21.50	2.8	18.44	23.05	2.8	44.44	13.64	2.8	13.06	41.90
3.7	6.42	40.43	3.7	58.53	21.51	3.8	19.70	23.10	3.8	46.17	13.52	3.8	13.21	41.80
4.7	6.75	40.55	4.7	59.18	21.54	4.8	20.90	23.15	4.8	47.98	13.41	4.8	13.37	41.70
5.7	7.07	40.66	5.7	59.87	21.58	5.7	22.04	23.19	5.8	49.89	13.30	5.8	13.51	41.61
6.7	7.38	40.77	6.7	60.54	21.63	6.7	23.16	23.22	6.8	51.84	13.20	6.8	13.66	41.51
7.7	7.70	40.87	7.7	61.21	21.72	7.7	24.27	23.25	7.8	53.79	13.13	7.8	13.80	41.40
8.7	8.02	40.96	8.7	61.86	21.81	8.7	25.42	23.26	8.8	55.72	13.07	8.8	13.93	41.27
9.7	8.35	41.05	9.7	62.47	21.92	9.7	26.61	23.27	9.8	57.58	13.02	9.8	14.07	41.14
10.7	8.69	41.15	10.7	63.05	22.03	10.7	27.85	23.28	10.8	59.38	12.99	10.8	14.22	41.02
11.7	9.05	41.26	11.7	63.62	22.13	11.7	29.14	23.31	11.8	61.12	12.96	11.8	14.37	40.90
12.7	9.41	41.39	12.7	64.17	22.24	12.7	30.45	23.35	12.8	62.80	12.93	12.8	14.53	40.79
13.7	9.77	41.52	13.7	64.71	22.33	13.7	31.78	23.41	13.8	64.45	12.90	13.8	14.70	40.69
14.7	10.11	41.69	14.7	65.25	22.43	14.7	33.11	23.49	14.8	66.08	12.87	14.8	14.87	40.59
15.7	10.45	41.86	15.7	65.80	22.52	15.7	34.43	23.58	15.7	67.72	12.84	15.8	15.03	40.52
16.7	10.79	42.04	16.7	66.34	22.60	16.7	35.71	23.68	16.7	69.39	12.80	16.8	15.20	40.47
17.7	11.11	42.23	17.7	66.90	22.68	17.7	36.95	23.80	17.7	71.09	12.75	17.8	15.37	40.43
18.7	11.41	42.42	18.7	67.49	22.78	18.7	38.16	23.91	18.7	72.83	12.71	18.8	15.54	40.40
19.7	11.70	42.61	19.7	68.09	22.88	19.7	39.31	24.04	19.7	74.64	12.66	19.8	15.69	40.39
20.7	11.98	42.81	20.7	68.70	23.00	20.7	40.39	24.16	20.7	76.51	12.63	20.8	15.85	40.37
21.7	12.26	43.00	21.7	69.32	23.13	21.7	41.43	24.27	21.7	78.43	12.62	21.8	16.00	40.36
22.7	12.52	43.18	22.7	69.94	23.27	22.7	42.47	24.37	22.7	80.35	12.62	22.8	16.15	40.33
23.7	12.79	43.35	23.7	70.52	23.45	23.7	43.51	24.46	23.7	82.27	12.64	23.8	16.30	40.30
24.7	13.06	43.52	24.7	71.09	23.63	24.7	44.57	24.56	24.7	84.12	12.68	24.8	16.45	40.26
25.7	13.35	43.69	25.7	71.63	23.81	25.7	45.68	24.66	25.7	85.91	12.72	25.8	16.60	40.22
26.7	13.64	43.87	26.7	72.15	23.98	26.7	46.85	24.78	26.7	87.61	12.76	26.8	16.76	40.20
27.6	13.93	44.07	27.7	72.63	24.13	27.7	48.06	24.91	27.7	89.24	12.80	27.8	16.93	40.19
28.6	14.23	44.29	28.7	73.12	24.28	28.7	49.25	25.07	28.7	90.83	12.84	28.8	17.10	40.19
29.6	14.51	44.53	29.7	73.62	24.42	29.7	50.40	25.25	29.7	92.44	12.85	29.8	17.27	40.23
30.6	14.76	44.80	30.6	74.14	24.56	30.7	51.49	25.45	30.7	94.10	12.86	30.8	17.45	40.28
31.6	15.00	45.07	31.6	74.69	24.69	31.7	52.50	25.65	31.7	95.84	12.86	31.8	17.62	40.34
16.92	+16.89		24.45	-24.43		58.66	+58.65		71.94	-71.94		7.41	+7.34	
17 ^h 57 ^m 4 ^s .326			18 ^h 9 ^m 46 ^s .186			18 ^h 55 ^m 23 ^s .393			19 ^h 37 ^m 1 ^s .735			20 ^h 48 ^m 15 ^s .385		
+86° 36' 50".43			-87° 39' 48".39			+89° 1' 32".83			-89° 12' 41".41			+82° 14' 50".67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Apr. 21 39	-83	4	Apr. 22 17	-86 21		Apr. 22 38	-81 46		Apr. 23 27	+86 52		Apr. 23 47	-82 26	
	s	"		s	"		s	"		s	"		s	"
0.9	7.16	8.39	0.9	0.34	20.57	0.9	6.74	54.58	0.9	30.98	55.94	0.9	25.13	40.64
1.9	7.29	8.12	1.9	0.54	20.26	1.9	6.81	54.26	1.9	31.15	55.62	1.9	25.16	40.30
2.9	7.42	7.84	2.9	0.73	19.95	2.9	6.88	53.93	2.9	31.34	55.33	2.9	25.19	39.93
3.9	7.56	7.54	3.9	0.93	19.62	3.9	6.97	53.57	3.9	31.55	55.05	3.9	25.22	39.55
4.9	7.71	7.23	4.9	1.16	19.28	4.9	7.06	53.21	4.9	31.75	54.79	4.9	25.26	39.16
5.9	7.89	6.94	5.9	1.42	18.94	5.9	7.16	52.85	5.9	31.94	54.54	5.9	25.31	38.75
6.9	8.07	6.65	6.9	1.69	18.61	6.9	7.27	52.51	6.9	32.12	54.30	6.9	25.37	38.34
7.9	8.25	6.37	7.9	1.97	18.29	7.9	7.38	52.16	7.9	32.29	54.04	7.9	25.45	37.95
8.9	8.43	6.12	8.9	2.27	18.00	8.9	7.51	51.83	8.9	32.45	53.78	8.9	25.53	37.57
9.9	8.60	5.88	9.9	2.56	17.72	9.9	7.64	51.53	9.9	32.61	53.51	9.9	25.61	37.20
10.8	8.78	5.68	10.9	2.85	17.45	10.9	7.75	51.24	10.9	32.78	53.22	10.9	25.69	36.86
11.8	8.93	5.47	11.9	3.13	17.21	11.9	7.86	50.96	11.9	32.96	52.93	11.9	25.77	36.52
12.8	9.09	5.26	12.9	3.38	16.96	12.9	7.97	50.69	12.9	33.15	52.64	12.9	25.83	36.19
13.8	9.25	5.06	13.9	3.63	16.70	13.9	8.07	50.42	13.9	33.38	52.35	13.9	25.89	35.86
14.8	9.41	4.85	14.9	3.89	16.45	14.9	8.17	50.15	14.9	33.62	52.06	14.9	25.96	35.54
15.8	9.56	4.63	15.9	4.14	16.20	15.9	8.27	49.87	15.9	33.88	51.78	15.9	26.03	35.22
16.8	9.72	4.41	16.9	4.41	15.95	16.9	8.37	49.59	16.9	34.15	51.53	16.9	26.10	34.89
17.8	9.89	4.19	17.9	4.67	15.68	17.9	8.48	49.30	17.9	34.42	51.29	17.9	26.16	34.55
18.8	10.06	3.97	18.9	4.93	15.40	18.9	8.59	49.00	18.9	34.70	51.05	18.9	26.24	34.21
19.8	10.24	3.73	19.9	5.21	15.13	19.9	8.70	48.70	19.9	34.99	50.83	19.9	26.32	33.84
20.8	10.42	3.50	20.8	5.52	14.85	20.9	8.83	48.40	20.9	35.26	50.63	20.9	26.41	33.48
21.8	10.61	3.29	21.8	5.84	14.58	21.9	8.97	48.11	21.9	35.53	50.43	21.9	26.50	33.11
22.8	10.81	3.09	22.8	6.17	14.34	22.9	9.12	47.82	22.9	35.77	50.24	22.9	26.60	32.75
23.8	11.01	2.90	23.8	6.51	14.09	23.9	9.27	47.55	23.9	36.01	50.03	23.9	26.71	32.41
24.8	11.21	2.72	24.8	6.85	13.87	24.9	9.42	47.30	24.9	36.25	49.81	24.9	26.83	32.08
25.8	11.41	2.58	25.8	7.19	13.67	25.8	9.56	47.06	25.9	36.51	49.59	25.9	26.95	31.76
26.8	11.60	2.43	26.8	7.51	13.47	26.8	9.69	46.83	26.9	36.78	49.36	26.9	27.06	31.47
27.8	11.78	2.29	27.8	7.82	13.28	27.8	9.83	46.61	27.9	37.07	49.13	27.9	27.16	31.18
28.8	11.95	2.13	28.8	8.11	13.09	28.8	9.96	46.39	28.9	37.39	48.90	28.9	27.25	30.89
29.8	12.12	1.96	29.8	8.39	12.89	29.8	10.07	46.16	29.9	37.73	48.71	29.9	27.34	30.58
30.8	12.29	1.78	30.8	8.68	12.66	30.8	10.19	45.91	30.9	38.10	48.53	30.9	27.43	30.27
31.8	12.47	1.60	31.8	8.99	12.43	31.8	10.32	45.64	31.9	38.46	48.38	31.9	27.54	29.94
8.29	-8.22		15.73	-15.70		6.99	-6.92		18.38	+18.35		7.60	-7.54	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	0 57	+85 50		1 32	+88 53		1 41	-85 9		4 11	+85 20		5 36	+85 9
	s	"		s	"		s	"		s	"		s	"
0.9	49.47	34.35	0.9	44.07	28.40	0.9	18.04	27.11	1.1	40.98	65.99	1.1	58.96	46.51
1.9	49.67	34.11	1.9	44.64	28.11	1.9	18.05	26.74	2.1	40.94	65.68	2.1	58.85	46.27
2.9	49.87	33.88	2.9	45.20	27.86	2.9	18.06	26.36	3.1	40.93	65.39	3.1	58.74	46.01
3.9	50.05	33.66	3.9	45.73	27.62	3.9	18.10	25.97	4.1	40.91	65.10	4.1	58.64	45.77
4.9	50.22	33.46	4.9	46.23	27.38	4.9	18.15	25.56	5.1	40.88	64.84	5.1	58.54	45.55
5.9	50.37	33.24	5.9	46.70	27.14	5.9	18.21	25.17	6.1	40.84	64.57	6.1	58.43	45.32
6.9	50.53	33.01	6.9	47.12	26.89	6.9	18.30	24.79	7.0	40.78	64.31	7.1	58.30	45.10
7.9	50.68	32.78	7.9	47.54	26.62	7.9	18.38	24.43	8.0	40.72	64.03	8.1	58.17	44.87
8.9	50.85	32.53	8.9	47.99	26.35	8.9	18.47	24.08	9.0	40.66	63.75	9.1	58.03	44.63
9.9	51.02	32.28	9.9	48.45	26.07	9.9	18.56	23.74	10.0	40.60	63.45	10.1	57.89	44.38
10.9	51.20	32.03	10.9	48.98	25.78	10.9	18.65	23.42	11.0	40.55	63.15	11.1	57.75	44.11
11.9	51.39	31.78	11.9	49.56	25.49	11.9	18.73	23.10	12.0	40.50	62.83	12.1	57.62	43.84
12.9	51.59	31.54	12.9	50.18	25.21	12.9	18.81	22.78	13.0	40.48	62.50	13.1	57.50	43.55
13.9	51.82	31.30	13.9	50.86	24.93	13.9	18.87	22.45	14.0	40.47	62.17	14.1	57.39	43.25
14.9	52.05	31.07	14.9	51.59	24.66	14.9	18.94	22.13	15.0	40.47	61.84	15.1	57.29	42.95
15.9	52.30	30.87	15.9	52.34	24.42	15.9	19.02	21.81	16.0	40.48	61.52	16.1	57.21	42.65
16.9	52.55	30.67	16.9	53.12	24.18	16.9	19.10	21.47	17.0	40.51	61.21	17.1	57.15	42.36
17.9	52.79	30.49	17.9	53.90	23.98	17.9	19.19	21.11	18.0	40.54	60.92	18.1	57.09	42.07
18.9	53.02	30.34	18.9	54.66	23.77	18.9	19.29	20.75	19.0	40.58	60.62	19.1	57.04	41.79
19.9	53.25	30.19	19.9	55.39	23.57	19.9	19.41	20.39	20.0	40.62	60.35	20.1	57.00	41.52
20.9	53.47	30.04	20.9	56.07	23.38	20.9	19.54	20.03	21.0	40.66	60.10	21.1	56.96	41.28
21.9	53.67	29.87	21.9	56.72	23.18	21.9	19.67	19.69	22.0	40.67	59.84	22.1	56.91	41.03
22.9	53.87	29.70	22.9	57.36	22.98	22.9	19.82	19.36	23.0	40.69	59.56	23.1	56.85	40.77
23.9	54.09	29.52	23.9	58.03	22.75	23.9	19.96	19.05	24.0	40.71	59.29	24.1	56.76	40.50
24.9	54.32	29.34	24.9	58.74	22.53	24.9	20.11	18.76	25.0	40.73	58.98	25.1	56.68	40.22
25.9	54.56	29.15	25.9	59.54	22.30	25.9	20.24	18.47	25.9	40.76	58.67	26.1	56.62	39.91
26.9	54.83	28.97	26.9	60.41	22.08	26.9	20.36	18.19	26.9	40.80	58.34	27.1	56.56	39.60
27.9	55.12	28.83	27.9	61.38	21.88	27.9	20.46	17.90	27.9	40.88	58.01	28.1	56.54	39.27
28.9	55.41	28.69	28.9	62.37	21.68	28.9	20.57	17.59	28.9	40.98	57.69	29.1	56.53	38.94
29.9	55.71	28.59	29.9	63.38	21.52	29.9	20.70	17.28	29.9	41.09	57.39	30.0	56.54	38.61
30.9	56.00	28.49	30.9	64.35	21.37	30.9	20.83	16.97	30.9	41.20	57.11	31.0	56.56	38.31
31.8	56.28	28.40	31.9	65.28	21.24	31.9	20.97	16.65	31.9	41.31	56.84	32.0	56.58	38.03
13.79	+13.75		51.63	+51.62		11.84	-11.80		12.34	+12.30		11.86	+11.81	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON:

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	5 44	-84 49		6 46	-80 44		7 4	+87 10		7 13	-86 55		7 14	+82 33
	s	"		s	"		s	"		s	"		s	"
1.1	51.06	61.41	1.2	24.25	29.20	1.2	50.00	28.73	1.2	67.04	13.61	1.2	56.43	58.32
2.1	50.84	61.22	2.2	24.11	29.09	2.2	49.66	28.55	2.2	66.58	13.56	2.2	56.32	58.14
3.1	50.61	61.02	3.2	23.97	28.97	3.2	49.34	28.37	3.2	66.12	13.50	3.2	56.21	57.97
4.1	50.39	60.79	4.2	23.83	28.83	4.2	49.05	28.20	4.2	65.66	13.41	4.2	56.09	57.82
5.1	50.17	60.55	5.2	23.69	28.68	5.2	48.75	28.05	5.2	65.20	13.31	5.2	55.98	57.68
6.1	49.96	60.28	6.2	23.55	28.50	6.2	48.44	27.89	6.2	64.75	13.18	6.2	55.87	57.55
7.1	49.76	60.01	7.2	23.42	28.32	7.2	48.13	27.74	7.2	64.32	13.04	7.2	55.74	57.41
8.1	49.58	59.74	8.2	23.29	28.12	8.2	47.81	27.59	8.2	63.91	12.89	8.2	55.62	57.28
9.1	49.40	59.48	9.2	23.17	27.92	9.2	47.48	27.44	9.2	63.52	12.74	9.2	55.49	57.15
10.1	49.23	59.22	10.1	23.06	27.73	10.2	47.12	27.26	10.2	63.13	12.58	10.2	55.36	57.01
11.1	49.08	58.98	11.1	22.95	27.54	11.2	46.76	27.09	11.2	62.76	12.44	11.2	55.22	56.84
12.1	48.91	58.74	12.1	22.84	27.36	12.2	46.40	26.89	12.2	62.40	12.30	12.2	55.08	56.66
13.1	48.74	58.49	13.1	22.73	27.18	13.2	46.06	26.67	13.2	62.03	12.17	13.2	54.94	56.47
14.1	48.58	58.25	14.1	22.62	27.01	14.2	45.72	26.44	14.2	61.67	12.04	14.2	54.81	56.28
15.1	48.41	58.02	15.1	22.50	26.83	15.1	45.42	26.21	15.2	61.30	11.92	15.2	54.70	56.06
16.1	48.24	57.79	16.1	22.39	26.66	16.1	45.13	25.98	16.2	60.92	11.80	16.2	54.59	55.83
17.1	48.06	57.54	17.1	22.28	26.48	17.1	44.86	25.73	17.1	60.52	11.66	17.2	54.49	55.61
18.1	47.89	57.27	18.1	22.17	26.29	18.1	44.62	25.49	18.1	60.12	11.52	18.1	54.40	55.39
19.1	47.71	57.00	19.1	22.04	26.07	19.1	44.39	25.25	19.1	59.72	11.34	19.1	54.31	55.19
20.1	47.54	56.70	20.1	21.92	25.85	20.1	44.19	25.04	20.1	59.32	11.16	20.1	54.23	54.99
21.1	47.39	56.38	21.1	21.81	25.61	21.1	43.97	24.84	21.1	58.94	10.97	21.1	54.15	54.80
22.1	47.24	56.06	22.1	21.70	25.36	22.1	43.74	24.63	22.1	58.56	10.76	22.1	54.06	54.61
23.1	47.11	55.75	23.1	21.60	25.09	23.1	43.50	24.42	23.1	58.21	10.54	23.1	53.97	54.42
24.1	46.99	55.44	24.1	21.50	24.84	24.1	43.23	24.20	24.1	57.88	10.32	24.1	53.87	54.22
25.1	46.87	55.14	25.1	21.41	24.59	25.1	42.96	23.98	25.1	57.56	10.12	25.1	53.77	54.00
26.1	46.75	54.85	26.1	21.32	24.36	26.1	42.69	23.72	26.1	57.25	9.92	26.1	53.66	53.77
27.1	46.63	54.58	27.1	21.23	24.14	27.1	42.45	23.45	27.1	56.94	9.74	27.1	53.56	53.51
28.1	46.51	54.32	28.1	21.14	23.93	28.1	42.22	23.15	28.1	56.62	9.58	28.1	53.47	53.23
29.1	46.38	54.06	29.1	21.05	23.71	29.1	42.03	22.85	29.1	56.29	9.41	29.1	53.41	52.95
30.1	46.24	53.79	30.1	20.95	23.49	30.1	41.87	22.55	30.1	55.95	9.24	30.1	53.36	52.68
31.0	46.11	53.49	31.1	20.85	23.25	31.1	41.73	22.27	31.1	55.59	9.05	31.1	53.31	52.41
32.0	45.98	53.17	32.1	20.75	22.98	32.1	41.62	22.00	32.1	55.23	8.82	32.1	53.26	52.16
11.10	-11.06		6.22	-6.13		20.28	+20.26		18.61	-18.58		7.73	+7.66	
5 ^h 45 ^m	4 ^s .700		6 ^h 46 ^m	28 ^s .850		7 ^h 4 ^m	58 ^s .549		7 ^h 14 ^m	18 ^s .185		7 ^h 14 ^m	59 ^s .083	
-84° 49'	38'' .84		-80° 44'	2'' .02		+87° 10'	21'' .62		-86° 54'	45'' .50		+82° 33'	51'' .51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '	May	h m	° '
	8 21	+88 51		9 8	-85 21		9 26	+81 40		9 36	-80 36		10 21	+82 57
	s	"		s	"		s	"		s	"		s	"
1.2	29.15	61.12	1.3	13.33	54.79	1.3	14.43	16.22	1.3	16.41	13.06	1.3	51.43	13.98
2.2	28.14	61.02	2.3	13.06	54.92	2.3	14.30	16.22	2.3	16.30	13.22	2.3	51.28	14.04
3.2	27.19	60.92	3.3	12.77	55.04	3.3	14.17	16.22	3.3	16.17	13.37	3.3	51.13	14.11
4.2	26.30	60.83	4.3	12.48	55.14	4.3	14.05	16.22	4.3	16.04	13.51	4.3	50.99	14.17
5.2	25.41	60.76	5.3	12.17	55.22	5.3	13.94	16.23	5.3	15.90	13.64	5.3	50.85	14.26
6.2	24.52	60.70	6.3	11.86	55.28	6.3	13.82	16.24	6.3	15.76	13.74	6.3	50.71	14.34
7.2	23.59	60.64	7.3	11.57	55.33	7.3	13.69	16.27	7.3	15.61	13.81	7.3	50.58	14.43
8.2	22.62	60.58	8.3	11.28	55.36	8.3	13.57	16.31	8.3	15.47	13.87	8.3	50.43	14.53
9.2	21.62	60.50	9.2	10.99	55.37	9.3	13.43	16.34	9.3	15.34	13.93	9.3	50.27	14.64
10.2	20.57	60.42	10.2	10.71	55.38	10.3	13.29	16.37	10.3	15.21	13.98	10.3	50.10	14.75
11.2	19.51	60.33	11.2	10.44	55.39	11.3	13.14	16.38	11.3	15.08	14.02	11.3	49.93	14.84
12.2	18.45	60.23	12.2	10.18	55.41	12.3	12.99	16.38	12.3	14.95	14.07	12.3	49.75	14.91
13.2	17.41	60.10	13.2	9.92	55.44	13.3	12.83	16.37	13.3	14.82	14.12	13.3	49.57	14.97
14.2	16.37	59.97	14.2	9.66	55.46	14.3	12.69	16.33	14.3	14.70	14.17	14.3	49.40	15.02
15.2	15.37	59.82	15.2	9.40	55.50	15.2	12.55	16.29	15.3	14.58	14.23	15.3	49.23	15.06
16.2	14.40	59.67	16.2	9.13	55.53	16.2	12.41	16.23	16.2	14.46	14.28	16.3	49.06	15.07
17.2	13.50	59.50	17.2	8.86	55.56	17.2	12.27	16.17	17.2	14.33	14.36	17.3	48.91	15.08
18.2	12.64	59.32	18.2	8.58	55.57	18.2	12.14	16.09	18.2	14.20	14.42	18.3	48.75	15.07
19.2	11.85	59.16	19.2	8.28	55.59	19.2	12.03	16.01	19.2	14.06	14.47	19.3	48.60	15.06
20.2	11.07	59.01	20.2	7.97	55.59	20.2	11.93	15.95	20.2	13.92	14.50	20.3	48.45	15.05
21.2	10.31	58.86	21.2	7.68	55.56	21.2	11.82	15.89	21.2	13.78	14.51	21.3	48.31	15.06
22.2	9.52	58.72	22.2	7.39	55.52	22.2	11.69	15.84	22.2	13.64	14.51	22.3	48.17	15.07
23.2	8.69	58.58	23.2	7.10	55.46	23.2	11.57	15.79	23.2	13.50	14.48	23.3	48.02	15.09
24.2	7.82	58.44	24.2	6.82	55.40	24.2	11.44	15.74	24.2	13.37	14.45	24.3	47.88	15.12
25.2	6.91	58.28	25.2	6.55	55.33	25.2	11.31	15.68	25.2	13.24	14.42	25.3	47.70	15.13
26.2	5.98	58.11	26.2	6.31	55.28	26.2	11.17	15.60	26.2	13.11	14.40	26.3	47.52	15.13
27.2	5.07	57.90	27.2	6.07	55.24	27.2	11.03	15.50	27.2	12.99	14.39	27.3	47.34	15.09
28.2	4.21	57.68	28.2	5.82	55.21	28.2	10.90	15.37	28.2	12.88	14.39	28.3	47.17	15.03
29.2	3.43	57.44	29.2	5.57	55.19	29.2	10.78	15.22	29.2	12.76	14.40	29.2	47.00	14.95
30.2	2.71	57.19	30.2	5.30	55.17	30.2	10.67	15.06	30.2	12.63	14.41	30.2	46.85	14.86
31.2	2.05	56.94	31.2	5.02	55.13	31.2	10.56	14.90	31.2	12.50	14.41	31.2	46.71	14.77
32.2	1.45	56.72	32.2	4.74	55.09	32.2	10.46	14.75	32.2	12.37	14.38	32.2	46.58	14.68
50.56	+50.55		12.38	-12.34		6.90	+6.83		6.12	-6.04		8.15	+8.09	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
May	h m 10 59	° ' -84 11	May	h m 12 14	° ' +88 7	May	h m 12 46	° ' -84 42	May	h m 12 48	° ' +83 49	May	h m 13 28	° ' -85.23
	s "	"		s "	"		s "	"		s "	"		s "	"
1.4	65.43	10.73	1.4	43.25	44.57	1.4	62.97	33.44	1.4	38.14	59.68	1.5	33.81	42.37
2.3	65.28	11.00	2.4	42.76	44.77	2.4	62.92	33.80	2.4	38.03	59.92	2.4	33.80	42.73
3.3	65.12	11.26	3.4	42.29	44.96	3.4	62.84	34.16	3.4	37.92	60.15	3.4	33.77	43.11
4.3	64.95	11.53	4.4	41.86	45.14	4.4	62.76	34.52	4.4	37.81	60.37	4.4	33.74	43.49
5.3	64.77	11.77	5.4	41.44	45.33	5.4	62.67	34.86	5.4	37.71	60.59	5.4	33.68	43.87
6.3	64.58	12.00	6.4	41.06	45.52	6.4	62.56	35.19	6.4	37.61	60.82	6.4	33.60	44.24
7.3	64.39	12.20	7.4	40.65	45.74	7.4	62.43	35.52	7.4	37.52	61.06	7.4	33.52	44.58
8.3	64.19	12.39	8.4	40.23	45.96	8.4	62.30	35.82	8.4	37.42	61.31	8.4	33.42	44.92
9.3	64.00	12.58	9.4	39.79	46.18	9.4	62.18	36.11	9.4	37.31	61.58	9.4	33.32	45.24
10.3	63.81	12.75	10.4	39.32	46.41	10.4	62.05	36.39	10.4	37.19	61.85	10.4	33.22	45.53
11.3	63.63	12.90	11.4	38.81	46.63	11.4	61.94	36.66	11.4	37.06	62.11	11.4	33.12	45.83
12.3	63.45	13.07	12.4	38.29	46.84	12.4	61.83	36.93	12.4	36.92	62.36	12.4	33.03	46.12
13.3	63.27	13.24	13.4	37.74	47.04	13.4	61.72	37.21	13.4	36.78	62.61	13.4	32.95	46.41
14.3	63.10	13.41	14.4	37.18	47.24	14.4	61.61	37.48	14.4	36.64	62.85	14.4	32.87	46.70
15.3	62.94	13.59	15.4	36.60	47.41	15.4	61.51	37.76	15.4	36.48	63.08	15.4	32.80	47.01
16.3	62.77	13.78	16.4	36.02	47.57	16.4	61.40	38.04	16.4	36.32	63.28	16.4	32.72	47.32
17.3	62.59	13.96	17.4	35.45	47.71	17.4	61.29	38.33	17.4	36.17	63.47	17.4	32.64	47.64
18.3	62.40	14.15	18.4	34.89	47.85	18.4	61.16	38.65	18.4	36.03	63.65	18.4	32.55	47.97
19.3	62.21	14.33	19.4	34.36	47.97	19.4	61.04	38.95	19.4	35.89	63.82	19.4	32.45	48.31
20.3	62.01	14.49	20.3	33.85	48.09	20.4	60.89	39.23	20.4	35.75	63.98	20.4	32.33	48.64
21.3	61.79	14.63	21.3	33.35	48.22	21.4	60.73	39.52	21.4	35.62	64.15	21.4	32.19	48.96
22.3	61.57	14.76	22.3	32.86	48.36	22.4	60.56	39.77	22.4	35.49	64.33	22.4	32.04	49.27
23.3	61.35	14.86	23.3	32.36	48.50	23.4	60.39	40.02	23.4	35.36	64.51	23.4	31.89	49.56
24.3	61.15	14.96	24.3	31.83	48.65	24.4	60.22	40.25	24.4	35.22	64.70	24.4	31.73	49.84
25.3	60.95	15.05	25.3	31.26	48.80	25.4	60.07	40.47	25.4	35.07	64.90	25.4	31.59	50.09
26.3	60.76	15.15	26.3	30.65	48.94	26.4	59.92	40.70	26.4	34.89	65.09	26.4	31.46	50.34
27.3	60.58	15.26	27.3	30.00	49.05	27.4	59.79	40.92	27.4	34.71	65.27	27.4	31.33	50.61
28.3	60.40	15.39	28.3	29.33	49.15	28.4	59.66	41.15	28.4	34.52	65.42	28.4	31.23	50.88
29.3	60.22	15.52	29.3	28.66	49.22	29.3	59.53	41.39	29.3	34.34	65.56	29.4	31.13	51.15
30.3	60.04	15.66	30.3	28.02	49.27	30.3	59.39	41.65	30.3	34.17	65.66	30.4	31.01	51.44
31.3	59.85	15.79	31.3	27.41	49.32	31.3	59.25	41.90	31.3	34.00	65.76	31.4	30.88	51.76
32.3	59.63	15.89	32.3	26.84	49.37	32.3	59.07	42.16	32.3	33.83	65.85	32.4	30.73	52.05
9.87	-9.82		30.64	+30.63		10.85	-10.80		9.31	+9.26		12.46	-12.42	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10'	46''.79		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
May 14 14		-83 19	May 15 1		+87 31	May 15 25		-84 12	May 16 53		+82 9	May 17 17		-80 47
	s	"		s	"		s	"		s	"		s	"
1.5	41.06	4.26	1.5	61.92	48.84	1.5	36.66	39.05	1.6	53.59	55.44	1.6	11.81	11.18
2.5	41.10	4.62	2.5	61.86	49.16	2.5	36.77	39.37	2.6	53.66	55.75	2.6	11.95	11.38
3.5	41.14	4.99	3.5	61.80	49.45	3.5	36.88	39.73	3.6	53.73	56.04	3.6	12.09	11.61
4.5	41.16	5.36	4.5	61.75	49.73	4.5	36.98	40.08	4.6	53.79	56.32	4.6	12.22	11.85
5.5	41.17	5.74	5.5	61.71	50.01	5.5	37.07	40.45	5.6	53.85	56.59	5.6	12.35	12.12
6.5	41.17	6.11	6.5	61.70	50.29	6.5	37.12	40.81	6.6	53.92	56.86	6.6	12.46	12.39
7.5	41.16	6.48	7.5	61.69	50.58	7.5	37.18	41.16	7.6	53.98	57.13	7.6	12.57	12.66
8.5	41.12	6.82	8.5	61.67	50.89	8.5	37.24	41.51	8.6	54.05	57.41	8.6	12.67	12.92
9.5	41.08	7.15	9.5	61.64	51.20	9.5	37.28	41.84	9.6	54.12	57.69	9.6	12.75	13.19
10.5	41.05	7.47	10.5	61.61	51.52	10.5	37.31	42.16	10.6	54.18	58.01	10.6	12.83	13.44
11.5	41.03	7.79	11.5	61.56	51.85	11.5	37.35	42.48	11.6	54.24	58.32	11.6	12.91	13.68
12.5	41.00	8.09	12.5	61.48	52.19	12.5	37.39	42.79	12.6	54.30	58.65	12.6	13.00	13.91
13.5	40.99	8.40	13.5	61.38	52.53	13.5	37.43	43.09	13.6	54.35	58.99	13.6	13.09	14.15
14.4	40.97	8.70	14.5	61.25	52.86	14.5	37.48	43.40	14.6	54.39	59.33	14.6	13.18	14.39
15.4	40.96	9.01	15.5	61.10	53.18	15.5	37.53	43.71	15.6	54.43	59.66	15.6	13.27	14.62
16.4	40.95	9.33	16.5	60.95	53.50	16.5	37.58	44.02	16.6	54.47	60.00	16.6	13.37	14.86
17.4	40.94	9.67	17.5	60.77	53.79	17.5	37.64	44.34	17.5	54.50	60.32	17.6	13.47	15.10
18.4	40.92	10.00	18.5	60.59	54.08	18.5	37.69	44.69	18.5	54.51	60.64	18.6	13.57	15.37
19.4	40.89	10.34	19.5	60.41	54.36	19.5	37.74	45.05	19.5	54.53	60.94	19.6	13.68	15.65
20.4	40.86	10.70	20.5	60.26	54.61	20.5	37.76	45.41	20.5	54.56	61.23	20.6	13.78	15.96
21.4	40.81	11.04	21.5	60.11	54.86	21.5	37.77	45.78	21.5	54.59	61.52	21.6	13.86	16.27
22.4	40.74	11.37	22.5	59.97	55.12	22.5	37.78	46.13	22.5	54.62	61.81	22.6	13.94	16.57
23.4	40.67	11.70	23.5	59.82	55.40	23.5	37.78	46.47	23.5	54.65	62.10	23.5	14.00	16.87
24.4	40.60	11.99	24.5	59.67	55.70	24.5	37.76	46.80	24.5	54.66	62.42	24.5	14.05	17.16
25.4	40.53	12.27	25.5	59.49	56.01	25.5	37.75	47.10	25.5	54.68	62.75	25.5	14.11	17.44
26.4	40.47	12.55	26.5	59.29	56.32	26.5	37.74	47.39	26.5	54.70	63.09	26.5	14.17	17.69
27.4	40.42	12.82	27.5	59.06	56.62	27.5	37.74	47.68	27.5	54.71	63.45	27.5	14.24	17.94
28.4	40.38	13.10	28.4	58.78	56.91	28.5	37.77	47.99	28.5	54.70	63.81	28.5	14.32	18.18
29.4	40.35	13.41	29.4	58.48	57.19	29.5	37.80	48.30	29.5	54.69	64.15	29.5	14.41	18.45
30.4	40.31	13.72	30.4	58.18	57.43	30.5	37.81	48.62	30.5	54.67	64.50	30.5	14.49	18.73
31.4	40.27	14.04	31.4	57.89	57.67	31.5	37.83	48.96	31.5	54.66	64.81	31.5	14.57	19.01
32.4	40.21	14.37	32.4	57.60	57.90	32.4	37.83	49.32	32.5	54.64	65.10	32.5	14.65	19.32
8.60	-8.54		23.22	+23.20		9.92	-9.87		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m	23 ^s .592		15 ^h 1 ^m	45 ^s .970		15 ^h 25 ^m	17 ^s .036		16 ^h 53 ^m	48 ^s .037		17 ^h 17 ^m	1 ^s .936	
-83° 19'	1'".42		+87° 31'	46'".68		-84° 12'	45'".34		+82° 9'	58'".64		-80° 47'	29'".50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
May 17 57	+86 36		May 18 10	-87 39		May 18 55	+89 1		May 19 37	-89 12		May 20 48	+82 14	
s	"		s	"		s	"		s	"		s	"	
1.6 15.00	45.07	1.6	14.69	24.69	1.7	52.50	25.65	1.7	35.84	12.86	1.8	17.62	40.34	
2.6 15.21	45.32	2.6	15.27	24.84	2.7	53.44	25.85	2.7	37.65	12.89	2.8	17.77	40.43	
3.6 15.41	45.57	3.6	15.85	25.02	3.7	54.33	26.04	3.7	39.52	12.92	3.8	17.93	40.49	
4.6 15.62	45.81	4.6	16.42	25.20	4.7	55.19	26.22	4.7	41.41	12.96	4.7	18.08	40.56	
5.6 15.82	46.05	5.6	16.97	25.41	5.7	56.06	26.39	5.7	43.27	13.03	5.7	18.23	40.63	
6.6 16.04	46.27	6.6	17.49	25.63	6.7	56.95	26.56	6.7	45.07	13.12	6.7	18.38	40.68	
7.6 16.26	46.49	7.6	17.97	25.85	7.7	57.89	26.73	7.7	46.79	13.22	7.7	18.53	40.73	
8.6 16.48	46.72	8.6	18.44	26.08	8.7	58 88	26.90	8.7	48.45	13.33	8.7	18.68	40.77	
9.6 16.71	46.96	9.6	18.87	26.30	9.7	59.90	27.08	9.7	50.02	13.44	9.7	18.84	40.82	
10.6 16.94	47.21	10.6	19.30	26.50	10.7	60.93	27.27	10.7	51.54	13 55	10.7	18.99	40.88	
11.6 17.17	47.48	11.6	19.71	26.71	11.7	61.93	27.47	11.7	53.03	13.65	11.7	19.17	40.96	
12.6 17.38	47.76	12.6	20.12	26.91	12.6	62.92	27.70	12.7	54.52	13.75	12.7	19.32	41.05	
13.6 17.58	48.05	13.6	20.53	27.11	13.6	63.88	27.94	13.7	56.01	13.84	13.7	19.48	41.14	
14.6 17.78	48.36	14.6	20.95	27.31	14.6	64.80	28 18	14.7	57.50	13.92	14.7	19.65	41.27	
15.6 17.95	48.67	15.6	21.38	27.50	15.6	65.66	28.44	15.7	59.04	14.01	15.7	19.82	41.41	
16.6 18.10	48.96	16.6	21.84	27.71	16.6	66.46	28.69	16.7	60.63	14.09	16.7	19.97	41.56	
17.6 18.24	49.26	17.6	22.30	27.93	17.6	67.20	28.94	17.7	62.27	14.19	17.7	20.12	41.71	
18.6 18.38	49.56	18.6	22.76	28.15	18.6	67.88	29.20	18.7	63.95	14.32	18.7	20.27	41.86	
19.6 18.50	49.84	19.6	23.23	28.38	19.6	68.53	29.44	19.7	65.64	14.44	19.7	20.41	42.01	
20.6 18.63	50.11	20.6	23.68	28.65	20.6	69.17	29.68	20.7	67.33	14.58	20.7	20.55	42.15	
21.6 18.76	50.37	21.6	24.10	28.93	21.6	69.83	29.90	21.7	68.95	14.76	21.7	20.69	42.29	
22.6 18.89	50.63	22.6	24.49	29.20	22.6	70.51	30.11	22.6	70.51	14.93	22.7	20.82	42.41	
23.6 19.03	50.90	23.6	24.84	29.48	23.6	71.24	30.34	23.6	71.97	15.10	23.7	20.95	42.53	
24.6 19.17	51.18	24.6	25.17	29.75	24.6	72.00	30.57	24.6	73.33	15.28	24.7	21.09	42.67	
25.6 19.31	51.49	25.6	25.48	29.99	25.6	72.76	30.83	25.6	74.65	15.43	25.7	21.23	42.83	
26.6 19.45	51.80	26.6	25.80	30.24	26.6	73.49	31.11	26.6	75.95	15.58	26.7	21.38	43.01	
27.6 19.55	52.13	27.6	26.14	30.47	27.6	74.16	31.42	27.6	77.27	15.71	27.7	21.54	43.20	
28.6 19.64	52.48	28.6	26.51	30.69	28.6	74.75	31.73	28.6	78.65	15.85	28.7	21.69	43.42	
29.6 19.70	52.83	29.6	26.89	30.91	29.6	75.23	32.04	29.6	80.11	15.98	29.7	21.84	43.65	
30.6 19.75	53.16	30.6	27.30	31.17	30.6	75.69	32.34	30.6	81.63	16.13	30.7	21.97	43.88	
31.6 19.78	53.47	31.6	27.70	31.44	31.6	76.07	32.63	31.6	83.19	16.30	31.7	22.09	44.11	
32.6 19.82	53.76	32.6	28.08	31.72	32.6	76.44	32.91	32.6	84.71	16.48	32.7	22.20	44.34	
16.93	+16.90		24.47	-24.45		58.74	+58.73		71.97	-71.97		7.41	+7.34	
17 ^h 57 ^m 4 ^s .326			18 ^h 9 ^m 46 ^s .186			18 ^h 55 ^m 23 ^s .393			19 ^h 37 ^m 1 ^s .735			20 ^h 48 ^m 15 ^s .385		
+86° 36' 50".43			-87° 39' 48".39			+89° 1' 32".83			-89° 12' 41".41			+82° 14' 50".67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
May	21 39	-83 3	May	22 17	-86 21	May	22 38	-81 46	May	23 27	+86 52	May	23 47	-82 26
	s	"		s	"		s	"		s	"		s	"
1.8	12.47	61.60	1.8	8.99	12.43	1.8	10.32	45.64	1.9	38.46	48.38	1.9	27.54	29.94
2.8	12.66	61.41	2.8	9.31	12.19	2.8	10.46	45.37	2.9	38.81	48.24	2.9	27.64	29.61
3.8	12.87	61.24	3.8	9.65	11.96	3.8	10.62	45.12	3.9	39.13	48.11	3.9	27.76	29.28
4.8	13.08	61.08	4.8	10.02	11.75	4.8	10.77	44.87	4.9	39.45	47.99	4.9	27.89	28.94
5.8	13.30	60.93	5.8	10.39	11.56	5.8	10.93	44.63	5.9	39.75	47.86	5.9	28.02	28.62
6.8	13.51	60.80	6.8	10.76	11.38	6.8	11.09	44.42	6.9	40.04	47.72	6.9	28.16	28.33
7.8	13.71	60.71	7.8	11.13	11.21	7.8	11.24	44.22	7.8	40.35	47.55	7.9	28.29	28.04
8.8	13.91	60.62	8.8	11.48	11.08	8.8	11.40	44.04	8.8	40.66	47.38	8.9	28.43	27.78
9.8	14.10	60.54	9.8	11.82	10.95	9.8	11.55	43.87	9.8	40.98	47.21	9.9	28.56	27.54
10.8	14.29	60.46	10.8	12.15	10.82	10.8	11.70	43.72	10.8	41.32	47.06	10.9	28.69	27.30
11.8	14.46	60.37	11.8	12.46	10.69	11.8	11.84	43.56	11.8	41.68	46.90	11.9	28.81	27.06
12.8	14.64	60.28	12.8	12.78	10.56	12.8	11.97	43.39	12.8	42.05	46.76	12.8	28.93	26.82
13.8	14.82	60.20	13.8	13.10	10.43	13.8	12.10	43.22	13.8	42.44	46.63	13.8	29.04	26.58
14.8	15.01	60.11	14.8	13.42	10.29	14.8	12.25	43.04	14.8	42.83	46.52	14.8	29.16	26.33
15.8	15.19	60.01	15.8	13.74	10.14	15.8	12.39	42.87	15.8	43.23	46.42	15.8	29.29	26.06
16.8	15.38	59.90	16.8	14.07	9.99	16.8	12.53	42.70	16.8	43.63	46.33	16.8	29.41	25.80
17.7	15.58	59.80	17.8	14.43	9.85	17.8	12.69	42.51	17.8	44.01	46.28	17.8	29.55	25.53
18.7	15.79	59.71	18.8	14.79	9.71	18.8	12.86	42.32	18.8	44.38	46.22	18.8	29.69	25.27
19.7	16.01	59.65	19.8	15.17	9.58	19.8	13.03	42.15	19.8	44.73	46.16	19.8	29.84	25.00
20.7	16.23	59.58	20.8	15.56	9.47	20.8	13.21	42.00	20.8	45.07	46.10	20.8	30.01	24.76
21.7	16.45	59.54	21.8	15.95	9.37	21.8	13.38	41.86	21.8	45.40	46.03	21.8	30.18	24.52
22.7	16.65	59.53	22.8	16.34	9.30	22.8	13.55	41.75	22.8	45.74	45.95	22.8	30.33	24.31
23.7	16.86	59.52	23.8	16.72	9.24	23.8	13.72	41.65	23.8	46.10	45.87	23.8	30.49	24.11
24.7	17.06	59.51	24.8	17.07	9.18	24.8	13.87	41.56	24.8	46.47	45.79	24.8	30.64	23.92
25.7	17.24	59.50	25.8	17.41	9.12	25.8	14.02	41.47	25.8	46.85	45.73	25.8	30.78	23.74
26.7	17.41	59.47	26.8	17.73	9.05	26.8	14.16	41.36	26.8	47.26	45.67	26.8	30.92	23.56
27.7	17.59	59.44	27.7	18.05	8.97	27.8	14.30	41.23	27.8	47.68	45.64	27.8	31.06	23.37
28.7	17.76	59.39	28.7	18.37	8.88	28.8	14.45	41.10	28.8	48.12	45.63	28.8	31.20	23.15
29.7	17.96	59.34	29.7	18.73	8.78	29.8	14.63	40.97	29.8	48.54	45.64	29.8	31.34	22.93
30.7	18.16	59.29	30.7	19.09	8.69	30.8	14.79	40.84	30.8	48.94	45.68	30.8	31.50	22.72
31.7	18.38	59.26	31.7	19.47	8.62	31.8	14.96	40.73	31.8	49.32	45.71	31.8	31.67	22.50
32.7	18.59	59.25	32.7	19.88	8.56	32.7	15.14	40.62	32.8	49.69	45.74	32.8	31.84	22.30
8.28	-8.22		15.72	-15.69		6.99	-6.92		18.37	+18.34		7.60	-7.54	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	0 57	+85 50	June	1 33	+88 53	June	1 41	-85 9	June	4 11	+85 20	June	5 36	+85 9
	s	"		s	"		s	"		s	"		s	"
0.8	56.28	28.40	0.9	5.28	21.24	0.9	20.97	16.65	0.9	41.31	56.84	1.0	56.58	38.03
1.8	56.55	28.31	1.9	6.17	21.11	1.9	21.14	16.32	1.9	41.41	56.60	2.0	56.60	37.77
2.8	56.79	28.22	2.9	7.01	20.98	2.9	21.32	16.00	2.9	41.51	56.35	3.0	56.61	37.50
3.8	57.03	28.12	3.9	7.83	20.84	3.9	21.50	15.71	3.9	41.59	56.10	4.0	56.61	37.23
4.8	57.27	28.00	4.9	8.65	20.69	4.9	21.68	15.43	4.9	41.65	55.83	5.0	56.60	36.95
5.8	57.52	27.90	5.9	9.49	20.51	5.9	21.87	15.16	5.9	41.73	55.57	6.0	56.59	36.67
6.8	57.79	27.79	6.9	10.37	20.34	6.9	22.05	14.92	6.9	41.81	55.29	7.0	56.57	36.38
7.8	58.06	27.66	7.9	11.29	20.17	7.9	22.23	14.68	7.9	41.89	55.01	8.0	56.56	36.07
8.8	58.35	27.55	8.8	12.26	20.02	8.9	22.40	14.45	8.9	41.99	54.72	9.0	56.55	35.75
9.8	58.64	27.44	9.8	13.28	19.86	9.9	22.57	14.22	9.9	42.10	54.42	10.0	56.56	35.42
10.8	58.96	27.34	10.8	14.34	19.72	10.8	22.73	13.98	10.9	42.23	54.12	11.0	56.59	35.09
11.8	59.26	27.28	11.8	15.42	19.59	11.8	22.90	13.75	11.9	42.36	53.83	12.0	56.63	34.76
12.8	59.57	27.22	12.8	16.53	19.48	12.8	23.07	13.51	12.9	42.51	53.55	13.0	56.68	34.45
13.8	59.90	27.19	13.8	17.64	19.38	13.8	23.24	13.26	13.9	42.68	53.29	14.0	56.76	34.15
14.8	60.20	27.17	14.8	18.73	19.30	14.8	23.42	12.99	14.9	42.85	53.04	15.0	56.84	33.86
15.8	60.49	27.16	15.8	19.78	19.24	15.8	23.62	12.73	15.9	43.03	52.81	16.0	56.93	33.57
16.8	60.78	27.15	16.8	20.78	19.18	16.8	23.84	12.48	16.9	43.18	52.59	16.9	57.01	33.30
17.8	61.05	27.14	17.8	21.73	19.12	17.8	24.06	12.23	17.9	43.33	52.37	17.9	57.07	33.03
18.8	61.32	27.13	18.8	22.67	19.05	18.8	24.29	12.00	18.9	43.47	52.15	18.9	57.13	32.77
19.8	61.59	27.09	19.8	23.60	18.97	19.8	24.52	11.79	19.9	43.60	51.93	19.9	57.19	32.51
20.8	61.86	27.06	20.8	24.56	18.88	20.8	24.75	11.59	20.9	43.74	51.69	20.9	57.24	32.24
21.8	62.14	27.02	21.8	25.58	18.79	21.8	24.96	11.41	21.9	43.88	51.44	21.9	57.29	31.95
22.8	62.45	26.98	22.8	26.68	18.70	22.8	25.16	11.24	22.9	44.05	51.19	22.9	57.37	31.63
23.8	62.77	26.97	23.8	27.86	18.63	23.8	25.36	11.06	23.9	44.23	50.92	23.9	57.45	31.31
24.8	63.11	26.97	24.8	29.08	18.57	24.8	25.56	10.89	24.9	44.43	50.67	24.9	57.55	30.98
25.8	63.45	27.01	25.8	30.31	18.54	25.8	25.75	10.70	25.9	44.66	50.42	25.9	57.68	30.68
26.8	63.78	27.05	26.8	31.53	18.53	26.8	25.94	10.50	26.9	44.89	50.19	26.9	57.81	30.39
27.8	64.11	27.12	27.8	32.70	18.53	27.8	26.16	10.29	27.9	45.12	50.00	27.9	57.96	30.11
28.8	64.41	27.19	28.8	33.80	18.54	28.8	26.38	10.08	28.9	45.34	49.82	28.9	58.11	29.85
29.8	64.70	27.25	29.8	34.86	18.56	29.8	26.63	9.87	29.9	45.54	49.64	29.9	58.25	29.61
30.8	64.98	27.31	30.8	35.89	18.56	30.8	26.88	9.69	30.9	45.74	49.46	30.9	58.37	29.36
31.8	65.25	27.35	31.8	36.89	18.56	31.8	27.13	9.53	31.9	45.93	49.29	31.9	58.48	29.12
13.79	+13.75		51.56	+51.55		11.84	-11.79		12.33	+12.29		11.85	+11.81	
0 ^h 57 ^m	55°.489		1 ^h 33 ^m	11°.898		1 ^h 41 ^m	39°.995		4 ^h 11 ^m	48°.583		5 ^h 37 ^m	5°.478	
+85° 50'	41''.77		+88° 53'	34''.33		-85° 9'	32''.70		+85° 21'	5''.69		+85° 9'	42''.71	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelopardalis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 5 44	° ' -84 49	June	h m 6 46	° ' -80 44	June	h m 7 4	° ' +87 10	June	h m 7 13	° ' -86 55	June	h m 7 14	° ' +82 33
	s	"		s	"		s	"		s	"		s	"
1.0	45.98	53.17	1.1	20.75	22.98	1.1	41.62	22.00	1.1	55.23	8.82	1.1	53.26	52.16
2.0	45.85	52.84	2.1	20.66	22.71	2.1	41.50	21.74	2.1	54.89	8.59	2.1	53.21	51.91
3.0	45.75	52.50	3.1	20.58	22.42	3.1	41.37	21.49	3.1	54.55	8.34	3.1	53.17	51.68
4.0	45.66	52.16	4.1	20.50	22.12	4.1	41.21	21.24	4.1	54.25	8.07	4.1	53.11	51.45
5.0	45.58	51.83	5.1	20.42	21.82	5.1	41.03	20.99	5.1	53.96	7.81	5.1	53.04	51.23
6.0	45.50	51.50	6.1	20.34	21.52	6.1	40.85	20.73	6.1	53.71	7.54	6.1	52.97	50.99
7.0	45.44	51.17	7.1	20.28	21.23	7.1	40.67	20.46	7.1	53.46	7.29	7.1	52.91	50.73
8.0	45.38	50.85	8.1	20.22	20.95	8.1	40.49	20.18	8.1	53.22	7.04	8.1	52.84	50.46
9.0	45.31	50.56	9.1	20.16	20.67	9.1	40.34	19.87	9.1	52.99	6.80	9.1	52.77	50.18
10.0	45.25	50.26	10.1	20.10	20.40	10.1	40.19	19.56	10.1	52.76	6.57	10.1	52.70	49.89
11.0	45.19	49.97	11.1	20.04	20.13	11.1	40.05	19.24	11.1	52.52	6.34	11.1	52.65	49.60
12.0	45.12	49.68	12.1	19.97	19.88	12.1	39.95	18.93	12.1	52.28	6.11	12.1	52.60	49.29
13.0	45.05	49.38	13.1	19.91	19.61	13.1	39.86	18.60	13.1	52.03	5.87	13.1	52.56	48.98
14.0	44.98	49.06	14.1	19.85	19.33	14.1	39.80	18.29	14.1	51.77	5.64	14.1	52.55	48.69
15.0	44.92	48.74	15.1	19.78	19.04	15.1	39.76	17.97	15.1	51.50	5.38	15.1	52.54	48.39
16.0	44 85	48.41	16.0	19.71	18.72	16.1	39.74	17.67	16.1	51.25	5.11	16.1	52.53	48.11
17.0	44.80	48.05	17.0	19.65	18.40	17.1	39.71	17.40	17.1	51.00	4.80	17.1	52.52	47.84
18.0	44.75	47.69	18.0	19.60	18.07	18.1	39.68	17.13	18.1	50.75	4.49	18.1	52.51	47.59
18.9	44.71	47.33	19.0	19.55	17.72	19.1	39.64	16.86	19.1	50.54	4.17	19.1	52.48	47.34
19.9	44.70	46.99	20.0	19.50	17.38	20.1	39.59	16.59	20.1	50.35	3.85	20.1	52.45	47.07
20.9	44.69	46.64	21.0	19.45	17.05	21.0	39.52	16.30	21.1	50.17	3.56	21.1	52.43	46.80
21.9	44.68	46.31	22.0	19.42	16.75	22.0	39.45	15.98	22.1	50.03	3.28	22.1	52.40	46.52
22.9	41.68	46.02	23.0	19.39	16.46	23.0	39.38	15.66	23.0	49.88	3.01	23.1	52.37	46.20
23.9	44.68	45.72	24.0	19.36	16.17	24.0	39.34	15.33	24.0	49.72	2.75	24.0	52.35	45.88
24.9	44.65	45.43	25.0	19.32	15.89	25.0	39.33	14.99	25.0	49.55	2.50	25.0	52.35	45.55
25.9	44.62	45.12	26.0	19.29	15.60	26.0	39.36	14.64	26.0	49.38	2.25	26.0	52.36	45.21
26.9	44.61	44 81	27.0	19.25	15.29	27.0	39.42	14.30	27.0	49.19	1.98	27.0	52.39	44.88
27.9	44.59	44.48	28.0	19.21	14.98	28.0	39.51	13.97	28.0	49.00	1.70	28.0	52.43	44.57
28.9	44.58	44.14	29.0	19.17	14.66	29.0	39.59	13.67	29.0	48.81	1.38	29.0	52.46	44.28
29.9	44.58	43.77	30.0	19.14	14.32	30.0	39.66	13.38	30.0	48.63	1.06	30.0	52.49	43.99
30.9	44.59	43.41	31.0	19.13	13.95	31.0	39.72	13.09	31.0	48.49	0.73	31.0	52.50	43.72
31.9	44.62	43.07	32.0	19.11	13.60	32.0	39.77	12.81	32.0	48.38	0.40	32.0	52.52	43.45
11.10	-11.05		6.21	-6.13		+20.27	+20.24		18.60	-18.57		7.73	+7.66	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 35'0		7 ^h 4 ^m	58° 54'9		7 ^h 14 ^m	18° 18'5		7 ^h 14 ^m	59° 08'3	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June	8 20	+88 51	June	9 7	-85 21	June	9 26	+81 40	June	9 36	-80 36	June	10 21	+82 57
	s	"		s	"		s	"		s	"		s	"
1.2	61.45	56.72	1.2	64.74	55.09	1.2	10.46	14.75	1.2	12.37	14.38	1.2	46.58	14.68
2.2	60.85	56.50	2.2	64.45	55.01	2.2	10.36	14.61	2.2	12.24	14.34	2.2	46.44	14.60
3.1	60.23	56.31	3.2	64.17	54.92	3.2	10.27	14.49	3.2	12.10	14.28	3.2	46.31	14.54
4.1	59.58	56.12	4.2	63.90	54.79	4.2	10.17	14.38	4.2	11.97	14.19	4.2	46.17	14.47
5.1	58.89	55.92	5.2	63.63	54.67	5.2	10.06	14.27	5.2	11.83	14.11	5.2	46.03	14.42
6.1	58.17	55.71	6.2	63.38	54.54	6.2	9.93	14.14	6.2	11.69	14.01	6.2	45.88	14.37
7.1	57.44	55.49	7.2	63.14	54.41	7.2	9.81	14.01	7.2	11.57	13.91	7.2	45.72	14.31
8.1	56.70	55.26	8.2	62.91	54.28	8.2	9.69	13.87	8.2	11.47	13.80	8.2	45.55	14.23
9.1	55.97	55.02	9.2	62.68	54.16	9.2	9.56	13.72	9.2	11.36	13.70	9.2	45.38	14.14
10.1	55.27	54.75	10.2	62.45	54.04	10.2	9.45	13.54	10.2	11.25	13.61	10.2	45.22	14.04
11.1	54.59	54.49	11.2	62.23	53.93	11.2	9.34	13.36	11.2	11.14	13.53	11.2	45.06	13.91
12.1	53.96	54.22	12.2	62.01	53.82	12.2	9.23	13.17	12.2	11.02	13.44	12.2	44.91	13.78
13.1	53.38	53.94	13.2	61.78	53.71	13.2	9.13	12.97	13.2	10.90	13.35	13.2	44.77	13.64
14.1	52.87	53.65	14.2	61.54	53.59	14.2	9.03	12.75	14.2	10.78	13.27	14.2	44.63	13.49
15.1	52.41	53.36	15.1	61.30	53.47	15.2	8.94	12.54	15.2	10.66	13.19	15.2	44.49	13.33
16.1	52.00	53.09	16.1	61.05	53.34	16.2	8.85	12.33	16.2	10.54	13.07	16.2	44.37	13.17
17.1	51.63	52.83	17.1	60.79	53.18	17.2	8.78	12.13	17.2	10.41	12.94	17.2	44.26	13.02
18.1	51.24	52.59	18.1	60.53	53.00	18.2	8.71	11.94	18.2	10.29	12.80	18.2	44.15	12.88
19.1	50.83	52.34	19.1	60.29	52.81	19.2	8.63	11.76	19.2	10.17	12.62	19.2	44.02	12.75
20.1	50.37	52.10	20.1	60.05	52.61	20.2	8.54	11.58	20.2	10.06	12.45	20.2	43.89	12.62
21.1	49.86	51.83	21.1	59.83	52.41	21.1	8.45	11.39	21.2	9.95	12.28	21.2	43.76	12.49
22.1	49.33	51.55	22.1	59.64	52.21	22.1	8.36	11.19	22.1	9.84	12.11	22.2	43.61	12.35
23.1	48.80	51.24	23.1	59.46	52.02	23.1	8.26	10.96	23.1	9.74	11.94	23.2	43.46	12.18
24.1	48.32	50.93	24.1	59.27	51.84	24.1	8.16	10.72	24.1	9.64	11.80	24.2	43.32	11.99
25.1	47.92	50.60	25.1	59.08	51.69	25.1	8.07	10.45	25.1	9.54	11.67	25.2	43.19	11.77
26.1	47.59	50.27	26.1	58.88	51.55	26.1	7.99	10.18	26.1	9.45	11.54	26.2	43.05	11.55
27.1	47.35	49.94	27.1	58.67	51.40	27.1	7.93	9.91	27.1	9.35	11.40	27.2	42.94	11.32
28.1	47.16	49.61	28.1	58.45	51.22	28.1	7.88	9.64	28.1	9.25	11.25	28.2	42.84	11.10
29.1	46.99	49.30	29.1	58.24	51.02	29.1	7.83	9.37	29.1	9.14	11.08	29.2	42.74	10.88
30.1	46.83	49.02	30.1	58.02	50.80	30.1	7.78	9.13	30.1	9.03	10.89	30.2	42.65	10.67
31.1	46.64	48.74	31.1	57.82	50.56	31.1	7.72	8.90	31.1	8.92	10.67	31.2	42.56	10.47
32.1	46.41	48.46	32.1	57.62	50.32	32.1	7.67	8.67	32.1	8.81	10.45	32.2	42.46	10.28
50.48	+50.47		12.37	-12.33		6.90	+6.83		6.12	-6.04		8.15	+8.09	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
June 10 59		-84 11	June 12 14		+88 7	June 12 46		-84 42	June 12 48		+83 50	June 13 28		-85 23
	s	"		s	"		s	"		s	"		s	"
1.3	59.63	15.89	1.3	26.84	49.37	1.3	59.07	42.16	1.3	33.83	5.85	1.4	30.73	52.05
2.3	59.41	15.99	2.3	26.28	49.42	2.3	58.89	42.40	2.3	33.68	5.94	2.4	30.55	52.34
3.3	59.19	16.06	3.3	25.73	49.48	3.3	58.70	42.63	3.3	33.53	6.04	3.4	30.37	52.61
4.3	58.97	16.12	4.3	25.18	49.56	4.3	58.51	42.83	4.3	33.38	6.17	4.4	30.19	52.85
5.3	58.75	16.17	5.3	24.61	49.64	5.3	58.31	43.02	5.3	33.23	6.30	5.4	29.99	53.08
6.3	58.53	16.21	6.3	24.01	49.72	6.3	58.12	43.20	6.3	33.06	6.43	6.4	29.79	53.29
7.2	58.33	16.22	7.3	23.40	49.80	7.3	57.93	43.35	7.3	32.88	6.56	7.3	29.61	53.49
8.2	58.13	16.23	8.3	22.76	49.86	8.3	57.75	43.51	8.3	32.69	6.68	8.3	29.43	53.69
9.2	57.94	16.25	9.3	22.11	49.91	9.3	57.57	43.66	9.3	32.50	6.80	9.3	29.25	53.89
10.2	57.74	16.27	10.3	21.45	49.96	10.3	57.40	43.81	10.3	32.31	6.91	10.3	29.08	54.10
11.2	57.55	16.30	11.3	20.76	49.99	11.3	57.22	43.98	11.3	32.12	7.00	11.3	28.90	54.30
12.2	57.37	16.34	12.3	20.08	50.00	12.3	57.05	44.15	12.3	31.92	7.06	12.3	28.73	54.53
13.2	57.18	16.38	13.3	19.41	49.99	13.3	56.88	44.32	13.3	31.73	7.12	13.3	28.57	54.74
14.2	56.99	16.41	14.3	18.75	49.98	14.3	56.71	44.50	14.3	31.54	7.16	14.3	28.40	54.96
15.2	56.80	16.44	15.3	18.13	49.94	15.3	56.53	44.68	15.3	31.36	7.19	15.3	28.22	55.18
16.2	56.57	16.45	16.3	17.52	49.92	16.3	56.33	44.85	16.3	31.18	7.22	16.3	28.02	55.41
17.2	56.34	16.47	17.3	16.95	49.89	17.3	56.11	45.02	17.3	31.02	7.23	17.3	27.80	55.63
18.2	56.12	16.46	18.3	16.39	49.87	18.3	55.89	45.17	18.3	30.85	7.26	18.3	27.58	55.84
19.2	55.90	16.42	19.3	15.83	49.86	19.3	55.66	45.30	19.3	30.68	7.29	19.3	27.34	56.03
20.2	55.68	16.37	20.3	15.25	49.85	20.3	55.44	45.40	20.3	30.52	7.34	20.3	27.10	56.19
21.2	55.48	16.31	21.3	14.64	49.85	21.3	55.23	45.49	21.3	30.34	7.40	21.3	26.86	56.33
22.2	55.27	16.25	22.3	13.99	49.84	22.3	55.03	45.57	22.3	30.14	7.45	22.3	26.64	56.47
23.2	55.09	16.20	23.3	13.30	49.80	23.3	54.83	45.65	23.3	29.94	7.49	23.3	26.44	56.60
24.2	54.91	16.16	24.3	12.60	49.76	24.3	54.65	45.74	24.3	29.73	7.49	24.3	26.26	56.74
25.2	54.74	16.13	25.3	11.90	49.68	25.3	54.47	45.84	25.3	29.52	7.49	25.3	26.07	56.89
26.2	54.57	16.12	26.2	11.22	49.60	26.3	54.29	45.95	26.3	29.32	7.45	26.3	25.89	57.05
27.2	54.38	16.09	27.2	10.57	49.49	27.3	54.10	46.08	27.3	29.12	7.41	27.3	25.70	57.22
28.2	54.18	16.06	28.2	9.95	49.38	28.3	53.90	46.20	28.3	28.94	7.35	28.3	25.48	57.39
29.2	53.97	16.01	29.2	9.38	49.27	29.3	53.67	46.31	29.3	28.76	7.29	29.3	25.25	57.56
30.2	53.76	15.93	30.2	8.82	49.17	30.3	53.45	46.40	30.3	28.60	7.25	30.3	25.01	57.71
31.2	53.55	15.85	31.2	8.27	49.07	31.3	53.22	46.47	31.3	28.43	7.21	31.3	24.76	57.84
32.2	53.34	15.75	32.2	7.71	48.99	32.3	52.99	46.53	32.3	28.26	7.18	32.3	24.49	57.94
9.88	-9.82		30.65	+30.64		10.85	-10.80		9.31	+9.26		12.47	-12.43	
10 ^h 59 ^m	53 ^s .036		12 ^h 14 ^m	30 ^s .802		12 ^h 46 ^m	43 ^s .161		12 ^h 48 ^m	33 ^s .111		13 ^h 28 ^m	9 ^s .628	
-84° 10' 46".79			+88° 7' 36".40			-84° 42' 20".01			+83° 49' 52".98			-85° 23' 33".94		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 14 14	° ' -83 19	June	h m 15 1	° ' +87 31	June	h m 15 25	° ' -84 12	June	h m 16 53	° ' +82 10	June	h m 17 17	° ' -80 47
	s "	"		s "	"		s "	"		s "	"		s "	"
1.4	40.21	14.37	1.4	57.60	57.90	1.4	37.83	49.32	1.5	54.64	5.10	1.5	14.65	19.32
2.4	40.13	14.69	2.4	57.34	58.13	2.4	37.82	49.68	2.5	54.63	5.39	2.5	14.71	19.64
3.4	40.04	14.99	3.4	57.10	58.36	3.4	37.78	50.02	3.5	54.62	5.68	3.5	14.77	19.96
4.4	39.94	15.28	4.4	56.86	58.59	4.4	37.73	50.35	4.5	54.61	5.97	4.5	14.82	20.28
5.4	39.84	15.56	5.4	56.62	58.84	5.4	37.68	50.66	5.5	54.60	6.28	5.5	14.86	20.59
6.4	39.74	15.80	6.4	56.35	59.10	6.4	37.62	50.96	6.5	54.60	6.60	6.5	14.88	20.89
7.4	39.64	16.04	7.4	56.08	59.36	7.4	37.56	51.25	7.5	54.59	6.93	7.5	14.91	21.18
8.4	39.54	16.28	8.4	55.79	59.63	8.4	37.50	51.53	8.5	54.58	7.26	8.5	14.94	21.47
9.4	39.45	16.51	9.4	55.48	59.89	9.4	37.45	51.80	9.5	54.54	7.59	9.5	14.97	21.74
10.4	39.36	16.75	10.4	55.15	60.15	10.4	37.40	52.07	10.5	54.51	7.94	10.5	15.00	22.01
11.4	39.27	16.99	11.4	54.79	60.40	11.4	37.36	52.35	11.5	54.47	8.28	11.5	15.04	22.27
12.4	39.18	17.23	12.4	54.42	60.63	12.4	37.32	52.63	12.5	54.43	8.61	12.5	15.08	22.55
13.4	39.10	17.48	13.4	54.04	60.84	13.4	37.28	52.93	13.5	54.38	8.94	13.5	15.12	22.82
14.4	39.02	17.73	14.4	53.66	61.06	14.4	37.24	53.22	14.5	54.33	9.26	14.5	15.16	23.11
15.4	38.92	18.00	15.4	53.27	61.25	15.4	37.20	53.54	15.5	54.27	9.55	15.5	15.20	23.42
16.4	38.82	18.27	16.4	52.90	61.43	16.4	37.14	53.86	16.5	54.22	9.83	16.5	15.25	23.73
17.4	38.71	18.52	17.4	52.55	61.60	17.4	37.06	54.17	17.5	54.17	10.10	17.5	15.28	24.06
18.4	38.58	18.77	18.4	52.21	61.77	18.4	36.98	54.46	18.5	54.12	10.37	18.5	15.29	24.40
19.4	38.45	19.00	19.4	51.88	61.95	19.4	36.88	54.76	19.5	54.07	10.64	19.5	15.30	24.72
20.3	38.31	19.20	20.4	51.54	62.14	20.4	36.77	55.05	20.5	54.03	10.93	20.5	15.30	25.04
21.3	38.17	19.40	21.4	51.17	62.34	21.4	36.66	55.30	21.5	53.98	11.24	21.5	15.29	25.32
22.3	38.04	19.58	22.4	50.79	62.55	22.4	36.55	55.54	22.5	53.93	11.55	22.5	15.29	25.60
23.3	37.93	19.76	23.4	50.38	62.76	23.4	36.46	55.77	23.4	53.86	11.87	23.5	15.29	25.87
24.3	37.82	19.94	24.4	49.94	62.96	24.4	36.38	56.01	24.4	53.78	12.19	24.5	15.30	26.13
25.3	37.71	20.13	25.4	49.48	63.15	25.4	36.32	56.25	25.4	53.70	12.51	25.5	15.31	26.39
26.3	37.61	20.33	26.4	49.00	63.30	26.4	36.25	56.52	26.4	53.61	12.80	26.5	15.34	26.66
27.3	37.50	20.56	27.4	48.52	63.44	27.4	36.17	56.79	27.4	53.52	13.09	27.5	15.36	26.94
28.3	37.39	20.76	28.4	48.06	63.55	28.4	36.09	57.07	28.4	53.44	13.35	28.5	15.37	27.25
29.3	37.26	20.97	29.4	47.63	63.66	29.4	35.99	57.36	29.4	53.35	13.59	29.4	15.38	27.56
30.3	37.12	21.18	30.4	47.20	63.79	30.4	35.88	57.63	30.4	53.27	13.83	30.4	15.38	27.88
31.3	36.97	21.37	31.4	46.79	63.91	31.4	35.75	57.88	31.4	53.18	14.07	31.4	15.37	28.20
32.3	36.81	21.53	32.3	46.38	64.04	32.4	35.62	58.13	32.4	53.10	14.32	32.4	15.34	28.52
8.60	-8.54		23.24	+23.22		9.92	-9.87		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m	23 ^s .592		15 ^h 1 ^m	45 ^s .970		15 ^h 25 ^m	17 ^s .036		16 ^h 53 ^m	48 ^s .037		17 ^h 17 ^m	1 ^s .936	
-83° 19'	1'' .42		+87° 31'	46'' .68		-84° 12'	45'' .34		+82° 9'	58'' .64		-80° 47'	29'' .50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.	Wash. Mean Time	Right Ascen- sion.	Decli- nation.
June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "	June	h m	° ' "
	17 57	+86 36		18 10	-87 39		18 56	+89 1		19 38	-89 12		20 48	+82 14
	s	"		s	"		s	"		s	"		s	"
1.6	19.82	53.76	1.6	28.08	31.72	1.6	16.44	32.91	1.6	24.71	16.48	1.7	22.20	44.34
2.5	19.85	54.05	2.6	28.42	32.01	2.6	16.83	33.18	2.6	26.19	16.69	2.7	22.31	44.54
3.5	19.90	54.34	3.6	28.72	32.33	3.6	17.25	33.45	3.6	27.57	16.91	3.7	22.42	44.73
4.5	19.96	54.62	4.6	29.00	32.64	4.6	17.71	33.71	4.6	28.87	17.14	4.7	22.55	44.92
5.5	20.02	54.92	5.6	29.25	32.93	5.6	18.18	33.97	5.6	30.07	17.36	5.7	22.67	45.11
6.5	20.09	55.21	6.5	29.48	33.23	6.6	18.68	34.24	6.6	31.22	17.58	6.7	22.79	45.31
7.5	20.15	55.53	7.5	29.68	33.53	7.6	19.18	34.53	7.6	32.31	17.81	7.7	22.92	45.53
8.5	20.20	55.86	8.5	29.89	33.80	8.6	19.66	34.84	8.6	33.37	18.02	8.7	23.05	45.76
9.5	20.24	56.20	9.5	30.09	34.07	9.6	20.10	35.15	9.6	34.43	18.22	9.7	23.18	46.00
10.5	20.26	56.54	10.5	30.30	34.34	10.6	20.50	35.47	10.6	35.50	18.42	10.6	23.31	46.24
11.5	20.27	56.89	11.5	30.53	34.60	11.6	20.84	35.81	11.6	36.58	18.62	11.6	23.43	46.51
12.5	20.27	57.24	12.5	30.77	34.86	12.6	21.10	36.14	12.6	37.70	18.82	12.6	23.54	46.78
13.5	20.23	57.57	13.5	31.01	35.14	13.6	21.32	36.47	13.6	38.86	19.03	13.6	23.65	47.06
14.5	20.19	57.90	14.5	31.26	35.43	14.6	21.47	36.80	14.6	40.04	19.25	14.6	23.76	47.35
15.5	20.14	58.22	15.5	31.51	35.74	15.6	21.56	37.10	15.6	41.25	19.48	15.6	23.85	47.64
16.5	20.09	58.52	16.5	31.74	36.06	16.6	21.61	37.39	16.6	42.44	19.72	16.6	23.94	47.92
17.5	20.04	58.81	17.5	31.96	36.39	17.6	21.72	37.69	17.6	43.61	19.99	17.6	24.03	48.17
18.5	19.99	59.09	18.5	32.14	36.72	18.5	21.82	37.97	18.6	44.69	20.27	18.6	24.12	48.41
19.5	19.95	59.38	19.5	32.28	37.05	19.5	21.96	38.25	19.6	45.67	20.55	19.6	24.20	48.66
20.5	19.92	59.67	20.5	32.39	37.38	20.5	22.14	38.53	20.6	46.55	20.83	20.6	24.29	48.91
21.5	19.89	59.99	21.5	32.47	37.70	21.5	22.33	38.85	21.6	47.35	21.11	21.6	24.38	49.18
22.5	19.85	60.32	22.5	32.56	37.98	22.5	22.50	39.18	22.6	48.10	21.35	22.6	24.48	49.46
23.5	19.80	60.66	23.5	32.65	38.26	23.5	22.63	39.52	23.6	48.86	21.60	23.6	24.58	49.78
24.5	19.71	61.03	24.5	32.77	38.52	24.5	22.68	39.88	24.6	49.65	21.83	24.6	24.69	50.09
25.5	19.62	61.37	25.5	32.90	38.80	25.5	22.64	40.24	25.6	50.51	22.06	25.6	24.78	50.43
26.5	19.49	61.70	26.5	33.05	39.08	26.5	22.51	40.58	26.6	51.42	22.29	26.6	24.85	50.77
27.5	19.35	62.02	27.5	33.21	39.39	27.5	22.32	40.92	27.6	52.39	22.53	27.6	24.91	51.11
28.5	19.20	62.32	28.5	33.36	39.70	28.5	22.09	41.24	28.5	53.35	22.80	28.6	24.98	51.44
29.5	19.06	62.61	29.5	33.47	40.03	29.5	21.86	41.55	29.5	54.26	23.09	29.6	25.04	51.76
30.5	18.93	62.89	30.5	33.56	40.37	30.5	21.67	41.84	30.5	55.10	23.40	30.6	25.10	52.05
31.5	18.82	63.16	31.5	33.60	40.71	31.5	21.51	42.14	31.5	55.84	23.71	31.6	25.16	52.33
32.5	18.71	63.44	32.5	33.61	41.05	32.5	21.37	42.43	32.5	56.47	24.02	32.6	25.21	52.62
16.94	+16.91		24.49	-24.47		58.88	+58.87		72.11	-72.10		7.41	+7.34	
17 ^h 57 ^m	4 ^s .326		18 ^h 9 ^m	46 ^s .186		18 ^h 55 ^m	23 ^s .393		19 ^h 37 ^m	1 ^s .735		20 ^h 48 ^m	15 ^s .385	
+86° 36'	50'''.43		-87° 39'	48'''.39		+89° 1'	32'''.83		-89° 12'	41'''.41		+82° 14'	50'''.67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
June	h m 21 39	° ' -83 3	June	h m 22 17	° ' -86 21	June	h m 22 38	° ' -81 46	June	h m 23 27	° ' +86 52	June	h m 23 47	° ' -82 26
	s "	"		s "	"		s "	"		s "	"		s "	"
1.7	18.59	59.25	1.7	19.88	8.56	1.7	15.14	40.62	1.8	49.69	45.74	1.8	31.84	22.30
2.7	18.81	59.26	2.7	20.28	8.51	2.7	15.32	40.53	2.8	50.05	45.75	2.8	32.02	22.11
3.7	19.02	59.29	3.7	20.66	8.49	3.7	15.50	40.47	3.8	50.40	45.76	3.8	32.20	21.93
4.7	19.22	59.33	4.7	21.04	8.48	4.7	15.67	40.42	4.8	50.75	45.75	4.8	32.37	21.79
5.7	19.41	59.39	5.7	21.40	8.49	5.7	15.82	40.39	5.8	51.11	45.74	5.8	32.54	21.67
6.7	19.59	59.45	6.7	21.74	8.50	6.7	15.98	40.36	6.8	51.49	45.73	6.8	32.69	21.55
7.7	19.76	59.51	7.7	22.07	8.52	7.7	16.14	40.34	7.8	51.88	45.73	7.8	32.85	21.44
8.7	19.93	59.57	8.7	22.41	8.53	8.7	16.29	40.31	8.8	52.29	45.75	8.8	33.00	21.33
9.7	20.10	59.63	9.7	22.73	8.54	9.7	16.43	40.28	9.8	52.71	45.78	9.8	33.16	21.22
10.7	20.27	59.68	10.7	23.05	8.56	10.7	16.57	40.25	10.8	53.13	45.82	10.8	33.30	21.10
11.7	20.44	59.74	11.7	23.37	8.57	11.7	16.73	40.22	11.8	53.54	45.86	11.8	33.46	20.98
12.7	20.62	59.78	12.7	23.70	8.58	12.7	16.88	40.19	12.7	53.96	45.94	12.8	33.62	20.85
13.7	20.80	59.82	13.7	24.04	8.57	13.7	17.04	40.15	13.7	54.37	46.03	13.8	33.77	20.72
14.7	20.99	59.86	14.7	24.41	8.57	11.7	17.21	40.12	14.7	54.76	46.13	14.8	33.95	20.59
15.7	21.18	59.92	15.7	24.77	8.58	15.7	17.38	40.08	15.7	55.13	46.22	15.8	34.13	20.46
16.7	21.38	60.00	16.7	25.15	8.61	16.7	17.56	40.07	16.7	55.50	46.31	16.8	34.31	20.35
17.7	21.58	60.08	17.7	25.53	8.65	17.7	17.74	40.06	17.7	55.83	46.41	17.7	34.50	20.24
18.7	21.78	60.20	18.7	25.90	8.71	18.7	17.91	40.09	18.7	56.17	46.50	18.7	34.69	20.15
19.7	21.97	60.33	19.7	26.26	8.80	19.7	18.08	40.13	19.7	56.51	46.58	19.7	34.87	20.10
20.7	22.15	60.46	20.7	26.60	8.89	20.7	18.24	40.18	20.7	56.88	46.66	20.7	35.04	20.05
21.7	22.29	60.59	21.7	26.93	8.98	21.7	18.39	40.24	21.7	57.24	46.74	21.7	35.21	20.01
22.7	22.44	60.72	22.7	27.23	9.07	22.7	18.52	40.29	22.7	57.62	46.83	22.7	35.36	19.98
23.6	22.59	60.83	23.7	27.52	9.16	23.7	18.66	40.34	23.7	58.03	46.94	23.7	35.51	19.93
24.6	22.74	60.94	24.7	27.81	9.22	24.7	18.81	40.36	24.7	58.45	47.09	24.7	35.66	19.88
25.6	22.90	61.03	25.7	28.13	9.28	25.7	18.95	40.37	25.7	58.87	47.25	25.7	35.83	19.81
26.6	23.08	61.12	26.7	28.46	9.33	26.7	19.10	40.38	26.7	59.26	47.43	26.7	36.00	19.73
27.6	23.25	61.22	27.7	28.79	9.40	27.7	19.27	40.42	27.7	59.63	47.61	27.7	36.17	19.65
28.6	23.43	61.34	28.7	29.15	9.47	28.7	19.44	40.45	28.7	59.97	47.80	28.7	36.35	19.59
29.6	23.62	61.48	29.7	29.51	9.57	29.7	19.61	40.50	29.7	60.30	47.97	29.7	36.53	19.55
30.6	23.80	61.65	30.7	29.85	9.69	30.7	19.78	40.56	30.7	60.62	48.12	30.7	36.72	19.53
31.6	23.96	61.82	31.7	30.19	9.83	31.7	19.93	40.65	31.7	60.93	48.27	31.7	36.91	19.52
32.6	24.11	62.00	32.6	30.52	9.97	32.7	20.08	40.77	32.7	61.25	48.42	32.7	37.09	19.52
8.28	-8.22		15.72	-15.69		6.99	-6.92		18.37	+18.34		7.60	-7.53	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m 0 58	° ' +85 50	July	h m 1 33	° ' +88 53	July	h m 1 41	° ' -85 9	July	h m 4 11	° ' +85 20	July	h m 5 36	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.8	4.98	27.31	0.8	35.89	18.56	0.8	26.88	9.69	0.9	45.74	49.46	0.9	58.37	29.36
1.8	5.25	27.35	1.8	36.89	18.56	1.8	27.13	9.53	1.9	45.93	49.29	1.9	58.48	29.12
2.8	5.52	27.39	2.8	37.90	18.54	2.8	27.38	9.38	2.9	46.11	49.10	2.9	58.59	28.87
3.8	5.81	27.43	3.8	38.93	18.51	3.8	27.64	9.26	3.9	46.30	48.91	3.9	58.69	28.61
4.8	6.10	27.46	4.8	40.00	18.50	4.8	27.89	9.16	4.9	46.49	48.72	4.9	58.80	28.34
5.8	6.39	27.50	5.8	41.12	18.48	5.8	28.13	9.06	5.9	46.69	48.51	5.9	58.92	28.07
6.7	6.71	27.54	6.8	42.27	18.47	6.8	28.36	8.96	6.9	46.90	48.30	6.9	59.05	27.78
7.7	7.03	27.60	7.8	43.45	18.47	7.8	28.59	8.87	7.9	47.13	48.09	7.9	59.19	27.49
8.7	7.35	27.68	8.8	44.66	18.48	8.8	28.81	8.77	8.9	47.36	47.88	8.9	59.33	27.20
9.7	7.67	27.76	9.8	45.87	18.51	9.8	29.03	8.66	9.9	47.60	47.69	9.9	59.51	26.91
10.7	8.00	27.86	10.8	47.09	18.55	10.8	29.25	8.55	10.9	47.86	47.50	10.9	59.69	26.63
11.7	8.32	27.99	11.8	48.30	18.61	11.8	29.49	8.43	11.9	48.13	47.35	11.9	59.87	26.39
12.7	8.63	28.13	12.8	49.47	18.70	12.8	29.72	8.30	12.9	48.40	47.21	12.9	60.07	26.14
13.7	8.92	28.27	13.8	50.59	18.78	13.8	29.98	8.18	13.9	48.65	47.08	13.9	60.26	25.91
14.7	9.19	28.41	14.8	51.66	18.87	14.8	30.25	8.07	14.9	48.90	46.96	14.9	60.46	25.69
15.7	9.46	28.55	15.7	52.68	18.96	15.8	30.52	7.97	15.9	49.14	46.85	15.9	60.64	25.49
16.7	9.73	28.69	16.7	53.68	19.04	16.7	30.80	7.90	16.9	49.37	46.73	16.9	60.81	25.28
17.7	9.99	28.82	17.7	54.69	19.10	17.7	31.07	7.84	17.9	49.60	46.60	17.9	60.96	25.06
18.7	10.26	28.92	18.7	55.74	19.15	18.7	31.34	7.81	18.8	49.83	46.45	18.9	61.12	24.84
19.7	10.55	29.02	19.7	56.86	19.21	19.7	31.58	7.78	19.8	50.07	46.30	19.9	61.29	24.60
20.7	10.86	29.15	20.7	58.05	19.27	20.7	31.81	7.77	20.8	50.33	46.14	20.9	61.46	24.34
21.7	11.18	29.28	21.7	59.29	19.36	21.7	32.04	7.75	21.8	50.60	45.98	21.9	61.66	24.09
22.7	11.50	29.45	22.7	60.54	19.45	22.7	32.26	7.72	22.8	50.89	45.83	22.9	61.89	23.84
23.7	11.83	29.63	23.7	61.77	19.58	23.7	32.49	7.68	23.8	51.19	45.72	23.9	62.13	23.59
24.7	12.13	29.83	24.7	62.97	19.72	24.7	32.72	7.63	24.8	51.49	45.62	24.9	62.38	23.38
25.7	12.42	30.05	25.7	64.11	19.88	25.7	32.99	7.57	25.8	51.79	45.55	25.9	62.62	23.18
26.7	12.69	30.26	26.7	65.19	20.04	26.7	33.25	7.52	26.8	52.08	45.49	26.9	62.85	22.99
27.7	12.94	30.46	27.7	66.21	20.20	27.7	33.53	7.49	27.8	52.37	45.44	27.9	63.08	22.82
28.7	13.19	30.66	28.7	67.20	20.36	28.7	33.81	7.48	28.8	52.64	45.38	28.9	63.30	22.65
29.7	13.44	30.84	29.7	68.18	20.50	29.7	34.08	7.49	29.8	52.88	45.32	29.9	63.51	22.48
30.7	13.69	31.02	30.7	69.17	20.62	30.7	34.35	7.52	30.8	53.13	45.23	30.9	63.71	22.31
31.7	13.94	31.20	31.7	70.19	20.75	31.7	34.60	7.55	31.8	53.39	45.15	31.9	63.91	22.12
13.79	+13.75		51.56	+51.55		11.83	-11.79		12.33	+12.29		11.85	+11.80	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m 5 44	° ' -84 49	July	h m 6 46	° ' -80 44	July	h m 7 4	° ' +87 10	July	h m 7 13	° ' -86 54	July	h m 7 14	° ' +82 33
	s "	"		s "	"		s "	"		s "	"		s "	"
0.9	44.59	43.41	1.0	19.13	13.95	1.0	39.72	13.09	1.0	48.49	60.73	1.0	52.50	43.72
1.9	44.62	43.07	2.0	19.11	13.60	2.0	39.77	12.81	2.0	48.38	60.40	2.0	52.52	43.45
2.9	44.65	42.72	3.0	19.09	13.24	3.0	39.80	12.52	3.0	48.27	60.07	3.0	52.53	43.18
3.9	44.70	42.38	3.9	19.07	12.90	4.0	39.83	12.23	4.0	48.19	59.74	4.0	52.53	42.89
4.9	44.75	42.04	4.9	19.07	12.58	5.0	39.85	11.91	5.0	48.11	59.42	5.0	52.54	42.60
5.9	44.80	41.73	5.9	19.07	12.25	6.0	39.88	11.59	6.0	48.05	59.11	6.0	52.55	42.29
6.9	44.85	41.44	6.9	19.07	11.93	7.0	39.93	11.27	7.0	47.99	58.82	7.0	52.56	41.98
7.9	44.91	41.15	7.9	19.07	11.62	8.0	40.01	10.95	8.0	47.94	58.53	8.0	52.58	41.65
8.9	44.96	40.86	8.9	19.07	11.33	8.9	40.09	10.62	9.0	47.88	58.25	9.0	52.62	41.32
9.9	45.01	40.56	9.9	19.07	11.03	9.9	40.19	10.28	10.0	47.80	57.96	10.0	52.66	40.99
10.9	45.05	40.27	10.9	19.07	10.72	10.9	40.33	9.95	10.9	47.72	57.66	11.0	52.71	40.66
11.9	45.10	39.95	11.9	19.06	10.41	11.9	40.49	9.61	11.9	47.65	57.38	11.9	52.77	40.35
12.9	45.14	39.63	12.9	19.06	10.08	12.9	40.67	9.29	12.9	47.57	57.06	12.9	52.84	40.04
13.9	45.19	39.30	13.9	19.06	9.74	13.9	40.86	9.00	13.9	47.51	56.73	13.9	52.91	39.75
14.9	45.25	38.96	14.9	19.06	9.38	14.9	41.04	8.71	14.9	47.45	56.39	14.9	52.98	39.47
15.9	45.34	38.62	15.9	19.07	9.02	15.9	41.21	8.43	15.9	47.40	56.04	15.9	53.05	39.20
16.9	45.43	38.28	16.9	19.08	8.66	16.9	41.36	8.16	16.9	47.39	55.69	16.9	53.10	38.94
17.9	45.52	37.95	17.9	19.12	8.30	17.9	41.49	7.89	17.9	47.39	55.35	17.9	53.15	38.67
18.9	45.63	37.65	18.9	19.15	7.96	18.9	41.61	7.60	18.9	47.42	55.01	18.9	53.19	38.39
19.9	45.74	37.36	19.9	19.18	7.64	19.9	41.74	7.29	19.9	47.46	54.70	19.9	53.24	38.08
20.9	45.85	37.10	20.9	19.22	7.33	20.9	41.89	6.96	20.9	47.50	54.41	20.9	53.29	37.76
21.9	45.95	36.84	21.9	19.25	7.06	21.9	42.07	6.62	21.9	47.53	54.13	21.9	53.35	37.44
22.9	46.04	36.58	22.9	19.28	6.78	22.9	42.29	6.28	22.9	47.54	53.84	22.9	53.41	37.11
23.9	46.13	36.31	23.9	19.29	6.49	23.9	42.53	5.94	23.9	47.55	53.56	23.9	53.53	36.77
24.9	46.22	36.03	24.9	19.31	6.18	24.9	42.80	5.62	24.9	47.56	53.27	24.9	53.63	36.47
25.9	46.31	35.75	25.9	19.34	5.86	25.9	43.08	5.34	25.9	47.56	52.96	25.9	53.74	36.18
26.9	46.41	35.44	26.9	19.37	5.52	26.9	43.36	5.06	26.9	47.57	52.64	26.9	53.85	35.90
27.9	46.54	35.12	27.9	19.41	5.19	27.9	43.61	4.79	27.9	47.61	52.31	27.9	53.95	35.63
28.9	46.67	34.82	28.9	19.45	4.86	28.9	43.86	4.53	28.9	47.67	51.97	28.9	54.04	35.37
29.9	46.81	34.53	29.9	19.50	4.52	29.9	44.10	4.27	29.9	47.76	51.63	29.9	54.13	35.12
30.9	46.95	34.24	30.9	19.55	4.18	30.9	44.32	4.00	30.9	47.86	51.29	30.9	54.21	34.87
31.9	47.11	33.99	31.9	19.61	3.87	31.9	44.54	3.74	31.9	47.99	50.96	31.9	54.29	34.60
11.09	-11.05		6.21	-6.13		20.25	+20.22		18.58	-18.56		7.72	+7.66	
5 ^h 45 ^m	4° 7'00"		6 ^h 46 ^m	28° 8'50"		7 ^h 4 ^m	58° 5'49"		7 ^h 14 ^m	18° 1'185"		7 ^h 14 ^m	59° 0'083"	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
July	h m 8 20	° ' +88 51	July	h m 9 7	° ' -85 21	July	h m 9 26	° ' +81 39	July	h m 9 36	° ' -80 36	July	h m 10 21	° ' +82 57
	s	"		s	"		s	"		s	"		s	"
1.1	46.64	48.74	1.1	57.82	50.56	1.1	7.72	68.90	1.1	8.92	10.67	1.2	42.56	10.47
2.1	46.41	48.46	2.1	57.62	50.32	2.1	7.67	68.67	2.1	8.81	10.45	2.2	42.46	10.28
3.1	46.15	48.18	3.1	57.44	50.06	3.1	7.61	68.44	3.1	8.72	10.22	3.2	42.35	10.10
4.1	45.88	47.90	4.1	57.26	49.80	4.1	7.54	68.21	4.1	8.63	9.99	4.1	42.22	9.91
5.1	45.59	47.59	5.1	57.11	49.54	5.1	7.46	67.96	5.1	8.53	9.75	5.1	42.10	9.70
6.1	45.30	47.27	6.1	56.96	49.30	6.1	7.38	67.71	6.1	8.44	9.51	6.1	41.98	9.49
7.1	45.03	46.94	7.1	56.81	49.06	7.1	7.31	67.44	7.1	8.36	9.28	7.1	41.86	9.27
8.1	44.80	46.61	8.1	56.66	48.82	8.1	7.25	67.15	8.1	8.28	9.06	8.1	41.74	9.03
9.0	44.62	46.27	9.1	56.52	48.59	9.1	7.19	66.85	9.1	8.21	8.87	9.1	41.63	8.76
10.0	44.51	45.92	10.1	56.37	48.36	10.1	7.14	66.55	10.1	8.14	8.66	10.1	41.53	8.48
11.0	44.44	45.56	11.1	56.23	48.11	11.1	7.09	66.24	11.1	8.06	8.45	11.1	41.44	8.21
12.0	44.43	45.23	12.1	56.06	47.91	12.1	7.06	65.93	12.1	7.98	8.23	12.1	41.36	7.94
13.0	44.48	44.89	13.1	55.89	47.67	13.1	7.03	65.62	13.1	7.89	8.01	13.1	41.28	7.65
14.0	44.58	44.56	14.1	55.73	47.41	14.1	7.01	65.32	14.1	7.80	7.78	14.1	41.22	7.37
15.0	44.67	44.25	15.1	55.58	47.13	15.1	6.99	65.03	15.1	7.72	7.51	15.1	41.15	7.10
16.0	44.74	43.95	16.1	55.43	46.84	16.1	6.96	64.75	16.1	7.64	7.24	16.1	41.09	6.86
17.0	44.79	43.65	17.1	55.28	46.54	17.1	6.93	64.48	17.1	7.56	6.95	17.1	41.01	6.62
18.0	44.79	43.35	18.1	55.15	46.23	18.1	6.90	64.21	18.1	7.49	6.66	18.1	40.93	6.37
19.0	44.74	43.04	19.1	55.05	45.92	19.1	6.86	63.94	19.1	7.43	6.37	19.1	40.84	6.12
20.0	44.69	42.72	20.1	54.95	45.64	20.1	6.81	63.64	20.1	7.37	6.08	20.1	40.75	5.85
21.0	44.67	42.37	21.1	54.87	45.37	21.1	6.77	63.33	21.1	7.31	5.81	21.1	40.66	5.57
22.0	44.70	42.01	22.0	54.79	45.12	22.1	6.74	63.00	22.1	7.26	5.57	22.1	40.57	5.26
23.0	44.83	41.63	23.0	54.70	44.87	23.1	6.72	62.65	23.1	7.21	5.34	23.1	40.50	4.94
24.0	45.04	41.26	24.0	54.60	44.61	24.1	6.71	62.29	24.1	7.15	5.10	24.1	40.44	4.60
25.0	45.31	40.89	25.0	54.49	44.34	25.1	6.71	61.93	25.1	7.09	4.86	25.1	40.39	4.26
26.0	45.62	40.56	26.0	54.37	44.07	26.1	6.72	61.59	26.1	7.04	4.59	26.1	40.35	3.93
27.0	45.93	40.22	27.0	54.26	43.77	27.0	6.73	61.27	27.1	6.98	4.32	27.1	40.31	3.62
27.9	46.25	39.91	28.0	54.16	43.45	28.0	6.73	60.96	28.1	6.92	4.02	28.1	40.27	3.33
28.9	46.53	39.60	29.0	54.06	43.13	29.0	6.73	60.68	29.0	6.86	3.70	29.1	40.23	3.04
29.9	46.77	39.30	30.0	53.98	42.80	30.0	6.72	60.39	30.0	6.80	3.38	30.1	40.19	2.76
30.9	46.99	38.99	31.0	53.92	42.47	31.0	6.72	60.09	31.0	6.75	3.04	31.1	40.14	2.47
31.9	47.18	38.68	32.0	53.86	42.14	32.0	6.71	59.78	32.0	6.71	2.71	32.1	40.09	2.18
50.36 ° +50.35			12.37 ° -12.33			6.90 ° +6.83			6.12 ° -6.04			8.15 ° +8.09		
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	10 59	-84 11	July	12 13	+88 7	July	12 46	-84 42	July	12 48	+83 50	July	13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
1.2	53.55	15.85	1.2	68.27	49.07	1.3	53.22	46.47	1.3	28.43	7.21	1.3	24.76	57.84
2.2	53.34	15.75	2.2	67.71	48.99	2.3	52.99	46.53	2.3	28.26	7.18	2.3	24.49	57.94
3.2	53.13	15.62	3.2	67.14	48.93	3.3	52.76	46.56	3.3	28.08	7.15	3.3	24.24	58.04
4.2	52.94	15.49	4.2	66.54	48.85	4.2	52.53	46.57	4.2	27.90	7.12	4.3	23.99	58.12
5.2	52.75	15.36	5.2	65.93	48.77	5.2	52.30	46.58	5.2	27.71	7.09	5.3	23.74	58.19
6.2	52.57	15.22	6.2	65.28	48.68	6.2	52.10	46.59	6.2	27.51	7.06	6.3	23.50	58.25
7.2	52.39	15.09	7.2	64.64	48.59	7.2	51.89	46.59	7.2	27.32	7.03	7.3	23.26	58.31
8.2	52.22	14.98	8.2	63.99	48.46	8.2	51.69	46.60	8.2	27.11	6.98	8.3	23.03	58.36
9.2	52.06	14.87	9.2	63.33	48.32	9.2	51.49	46.61	9.2	26.91	6.90	9.3	22.81	58.42
10.2	51.89	14.75	10.2	62.69	48.18	10.2	51.29	46.63	10.2	26.71	6.81	10.3	22.60	58.50
11.2	51.72	14.64	11.2	62.07	48.00	11.2	51.09	46.66	11.2	26.52	6.70	11.3	22.38	58.58
12.2	51.54	14.53	12.2	61.46	47.82	12.2	50.88	46.69	12.2	26.33	6.58	12.3	22.16	58.66
13.2	51.36	14.40	13.2	60.90	47.63	13.2	50.68	46.72	13.2	26.15	6.45	13.3	21.92	58.75
14.1	51.18	14.27	14.2	60.37	47.44	14.2	50.45	46.73	14.2	25.98	6.32	14.2	21.66	58.83
15.1	50.99	14.12	15.2	59.87	47.27	15.2	50.21	46.74	15.2	25.83	6.19	15.2	21.39	58.89
16.1	50.80	13.94	16.2	59.37	47.10	16.2	49.98	46.72	16.2	25.68	6.08	16.2	21.12	58.94
17.1	50.61	13.76	17.2	58.86	46.95	17.2	49.73	46.68	17.2	25.51	5.97	17.2	20.84	58.95
18.1	50.42	13.56	18.2	58.35	46.80	18.2	49.50	46.63	18.2	25.34	5.86	18.2	20.57	58.96
19.1	50.26	13.36	19.2	57.79	46.66	19.2	49.27	46.56	19.2	25.16	5.76	19.2	20.30	58.95
20.1	50.11	13.16	20.2	57.19	46.49	20.2	49.07	46.48	20.2	24.97	5.65	20.2	20.06	58.93
21.1	49.97	12.97	21.2	56.57	46.31	21.2	48.87	46.41	21.2	24.76	5.53	21.2	19.83	58.92
22.1	49.84	12.79	22.2	55.95	46.11	22.2	48.69	46.35	22.2	24.57	5.39	22.2	19.61	58.91
23.1	49.70	12.62	23.2	55.31	45.88	23.2	48.50	46.30	23.2	24.37	5.22	23.2	19.39	58.91
24.1	49.55	12.47	24.2	54.78	45.64	24.2	48.32	46.27	24.2	24.19	5.04	24.2	19.17	58.91
25.1	49.41	12.30	25.2	54.25	45.39	25.2	48.12	46.24	25.2	24.01	4.84	25.2	18.94	58.93
26.1	49.24	12.12	26.2	53.76	45.14	26.2	47.90	46.19	26.2	23.86	4.63	26.2	18.70	58.95
27.1	49.07	11.93	27.2	53.29	44.89	27.2	47.68	46.14	27.2	23.71	4.43	27.2	18.46	58.96
28.1	48.92	11.71	28.2	52.86	44.65	28.2	47.45	46.06	28.2	23.56	4.23	28.2	18.18	58.94
29.1	48.76	11.48	29.2	52.41	44.43	29.2	47.22	45.97	29.2	23.41	4.05	29.2	17.90	58.90
30.1	48.61	11.23	30.2	51.96	44.22	30.2	46.98	45.84	30.2	23.25	3.88	30.2	17.62	58.85
31.1	48.46	10.96	31.2	51.50	44.00	31.2	46.76	45.72	31.2	23.10	3.71	31.2	17.35	58.78
32.1	48.32	10.71	32.1	51.02	43.79	32.2	46.55	45.58	32.2	22.92	3.55	32.2	17.08	58.70
9.87	-9.82		30.64	+30.63		10.85	-10.81		9.31	+9.26		12.47	-12.43	
10 ^h 59 ^m	53° 03'		12 ^h 14 ^m	30° 80'		12 ^h 46 ^m	43° 16'		12 ^h 48 ^m	33° 11'		13 ^h 28 ^m	9° 62'	
-84° 10'	46'' 79		+88° 7'	36'' 40		-84° 42'	20'' 01		+83° 49'	52'' 98		-85° 23'	33'' 94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	14 14	-83 19	July	15 1	+87 32	July	15 25	-84 12	July	16 53	+82 10	July	17 17	-80 47
	s	"		s	"		s	"		s	"		s	"
1.3	36.97	21.37	1.4	46.79	3.91	1.4	35.75	57.88	1.4	53.18	14.07	1.4	15.37	28.20
2.3	36.81	21.53	2.3	46.38	4.04	2.4	35.62	58.13	2.4	53.10	14.32	2.4	15.34	28.52
3.3	36.65	21.68	3.3	45.98	4.17	3.4	35.47	58.36	3.4	53.02	14.57	3.4	15.31	28.81
4.3	36.49	21.82	4.3	45.57	4.31	4.4	35.33	58.56	4.4	52.94	14.84	4.4	15.27	29.09
5.3	36.33	21.94	5.3	45.13	4.46	5.4	35.18	58.77	5.4	52.85	15.11	5.4	15.23	29.37
6.3	36.18	22.05	6.3	44.68	4.60	6.4	35.04	58.96	6.4	52.77	15.39	6.4	15.20	29.63
7.3	36.03	22.16	7.3	44.21	4.74	7.4	34.90	59.15	7.4	52.67	15.67	7.4	15.17	29.88
8.3	35.89	22.27	8.3	43.71	4.87	8.3	34.77	59.34	8.4	52.57	15.95	8.4	15.14	30.13
9.3	35.75	22.39	9.3	43.20	4.98	9.3	34.64	59.53	9.4	52.46	16.23	9.4	15.11	30.37
10.3	35.61	22.51	10.3	42.69	5.09	10.3	34.52	59.72	10.4	52.35	16.48	10.4	15.10	30.63
11.3	35.48	22.64	11.3	42.17	5.18	11.3	34.40	59.92	11.4	52.22	16.72	11.4	15.08	30.90
12.3	35.35	22.77	12.3	41.66	5.24	12.3	34.28	60.13	12.4	52.10	16.96	12.4	15.05	31.17
13.3	35.20	22.91	13.3	41.15	5.30	13.3	34.14	60.36	13.4	51.99	17.16	13.4	15.02	31.45
14.3	35.05	23.04	14.3	40.67	5.35	14.3	34.00	60.58	14.4	51.88	17.36	14.4	14.99	31.74
15.3	34.87	23.16	15.3	40.19	5.39	15.3	33.85	60.78	15.4	51.76	17.54	15.4	14.96	32.04
16.3	34.69	23.26	16.3	39.73	5.42	16.3	33.67	60.99	16.4	51.65	17.73	16.4	14.92	32.33
17.3	34.51	23.35	17.3	39.28	5.47	17.3	33.49	61.17	17.4	51.54	17.93	17.4	14.85	32.62
18.3	34.33	23.41	18.3	38.83	5.53	18.3	33.30	61.32	18.4	51.43	18.15	18.4	14.78	32.88
19.3	34.15	23.46	19.3	38.34	5.60	19.3	33.12	61.47	19.4	51.30	18.37	19.4	14.72	33.12
20.3	34.00	23.50	20.3	37.83	5.67	20.3	32.95	61.60	20.4	51.17	18.61	20.4	14.66	33.34
21.3	33.84	23.54	21.3	37.29	5.74	21.3	32.80	61.70	21.4	51.04	18.85	21.4	14.59	33.55
22.3	33.70	23.59	22.3	36.74	5.81	22.3	32.65	61.83	22.4	50.91	19.08	22.4	14.53	33.77
23.3	33.55	23.65	23.3	36.16	5.85	23.3	32.51	61.96	23.4	50.77	19.28	23.4	14.49	33.98
24.3	33.42	23.72	24.3	35.59	5.86	24.3	32.37	62.11	24.4	50.62	19.48	24.4	14.45	34.21
25.3	33.27	23.79	25.3	35.03	5.85	25.3	32.22	62.27	25.4	50.47	19.64	25.4	14.41	34.46
26.3	33.12	23.86	26.3	34.51	5.83	26.3	32.07	62.43	26.4	50.33	19.79	26.4	14.36	34.71
27.2	32.94	23.92	27.3	34.00	5.81	27.3	31.90	62.58	27.4	50.19	19.94	27.4	14.30	34.96
28.2	32.76	23.97	28.3	33.51	5.78	28.3	31.71	62.73	28.4	50.05	20.08	28.4	14.22	35.21
29.2	32.57	23.99	29.3	33.03	5.75	29.3	31.51	62.86	29.3	49.92	20.23	29.4	14.14	35.46
30.2	32.38	24.00	30.3	32.56	5.74	30.3	31.31	62.96	30.3	49.79	20.37	30.4	14.06	35.70
31.2	32.19	23.99	31.3	32.06	5.74	31.3	31.10	63.07	31.3	49.65	20.54	31.4	13.96	35.93
32.2	32.00	23.95	32.3	31.56	5.73	32.3	30.90	63.16	32.3	49.52	20.71	32.4	13.86	36.13
8.60	-8.54		23.25	+23.23		9.92	-9.87		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m	23°.592		15 ^h 1 ^m	45°.970		15 ^h 25 ^m	17°.036		16 ^h 53 ^m	48°.037		17 ^h 17 ^m	1°.936	
-83° 19'	1''.42		+87° 31'	46'''.68		-84° 12'	45'''.34		+82° 9'	58'''.64		-80° 47'	29'''.50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July 17 57	+86 37		July 18 10	-87 39		July 18 56	+89 1		July 19 38	-89 12		July 20 48	+82 14	
	s	"		s	"		s	"		s	"		s	"
1.5	18.82	3.16	1.5	33.60	40.71	1.5	21.51	42.14	1.5	55.84	23.71	1.6	25.16	52.33
2.5	18.71	3.44	2.5	33.61	41.05	2.5	21.37	42.43	2.5	56.47	24.02	2.6	25.21	52.62
3.5	18.60	3.72	3.5	33.61	41.38	3.5	21.28	42.73	3.5	57.02	24.33	3.6	25.27	52.91
4.5	18.49	4.01	4.5	33.58	41.70	4.5	21.18	43.04	4.5	57.50	24.62	4.6	25.33	53.20
5.5	18.36	4.33	5.5	33.54	41.99	5.5	21.06	43.36	5.5	57.94	24.91	5.6	25.40	53.52
6.5	18.24	4.64	6.5	33.49	42.29	6.5	20.92	43.68	6.5	58.36	25.20	6.6	25.47	53.84
7.5	18.10	4.95	7.5	33.45	42.58	7.5	20.74	44.02	7.5	58.77	25.48	7.6	25.53	54.18
8.5	17.93	5.28	8.5	33.42	42.86	8.5	20.50	44.37	8.5	59.19	25.75	8.6	25.59	54.52
9.4	17.76	5.60	9.5	33.40	43.13	9.5	20.19	44.72	9.5	59.64	26.03	9.6	25.64	54.88
10.1	17.57	5.91	10.5	33.39	43.42	10.5	19.82	45.06	10.5	60.11	26.29	10.6	25.70	55.24
11.4	17.37	6.21	11.5	33.39	43.70	11.5	19.39	45.40	11.5	60.62	26.57	11.6	25.74	55.60
12.4	17.14	6.50	12.5	33.39	44.02	12.5	18.90	45.73	12.5	61.14	26.86	12.6	25.78	55.96
13.4	16.92	6.77	13.4	33.38	44.33	13.5	18.38	46.02	13.5	61.67	27.17	13.6	25.80	56.31
14.4	16.70	7.02	14.4	33.34	44.66	14.5	17.87	46.32	14.5	62.19	27.48	14.6	25.81	56.65
15.4	16.50	7.27	15.4	33.27	44.99	15.5	17.35	46.60	15.5	62.62	27.82	15.6	25.83	56.98
16.4	16.29	7.51	16.4	33.18	45.33	16.5	16.88	46.88	16.5	62.94	28.15	16.6	25.85	57.29
17.4	16.09	7.75	17.4	33.05	45.66	17.5	16.45	47.16	17.5	63.16	28.49	17.5	25.86	57.60
18.1	15.90	8.02	18.1	32.89	45.96	18.5	16.04	47.45	18.5	63.27	28.82	18.5	25.90	57.91
19.4	15.70	8.29	19.4	32.71	46.25	19.5	15.64	47.77	19.5	63.32	29.14	19.5	25.93	58.25
20.4	15.49	8.58	20.4	32.53	46.53	20.5	15.21	48.09	20.5	63.35	29.42	20.5	25.96	58.61
21.4	15.26	8.87	21.4	32.39	46.78	21.5	14.71	48.42	21.5	63.39	29.70	21.5	26.00	58.97
22.4	15.00	9.17	22.4	32.26	47.03	22.5	14.11	48.76	22.5	63.48	29.96	22.5	26.01	59.35
23.1	14.73	9.46	23.4	32.15	47.30	23.5	13.44	49.09	23.5	63.65	30.23	23.5	26.03	59.74
24.4	14.45	9.74	24.4	32.05	47.57	24.4	12.70	49.42	24.5	63.87	30.51	24.5	26.04	60.13
25.4	14.15	9.98	25.4	31.95	47.85	25.4	11.90	49.72	25.5	64.08	30.82	25.5	26.04	60.50
26.4	13.86	10.22	26.4	31.82	48.16	26.4	11.09	50.01	26.5	64.28	31.14	26.5	26.02	60.86
27.4	13.57	10.42	27.4	31.66	48.47	27.4	10.32	50.28	27.5	64.40	31.47	27.5	26.01	61.21
28.4	13.29	10.63	28.4	31.47	48.78	28.4	9.57	50.54	28.5	64.44	31.80	28.5	26.00	61.54
29.4	13.02	10.84	29.4	31.25	49.09	29.4	8.86	50.80	29.5	64.36	32.14	29.5	25.98	61.87
30.4	12.76	11.06	30.4	30.99	49.38	30.4	8.19	51.06	30.5	64.18	32.48	30.5	25.97	62.19
31.4	12.50	11.28	31.4	30.71	49.66	31.4	7.52	51.33	31.5	63.94	32.80	31.5	25.96	62.52
32.4	12.24	11.52	32.4	30.42	49.93	32.4	6.85	51.62	32.5	63.63	33.12	32.5	25.96	62.85
16.95	+16.92		24.52	-24.50		59.05	+59.04		72.32	-72.31		7.41	+7.35	
17 ^h 57 ^m	4 ^s .326		18 ^h 9 ^m	46 ^s .186		18 ^h 55 ^m	23 ^s .393		19 ^h 37 ^m	1 ^s .735		20 ^h 48 ^m	15 ^s .385	
+86° 36'	50'' .43		-87° 39'	48'' .39		+89° 1'	32'' .83		-89° 12'	41'' .41		+82° 14'	50'' .67	

APPARENT PLACES OF STARS, 1923.

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
July	21 39	-83 4	July	22 17	-86 21	July	22 38	-81 46	July	23 28	+86 52	July	23 47	-82 26
	s	"		s	"		s	"		s	"		s	"
1.6	23.96	1.82	1.7	30.19	9.83	1.7	19.93	40.65	1.7	0.93	48.27	1.7	36.91	19.52
2.6	24.11	2.00	2.6	30.52	9.97	2.7	20.08	40.77	2.7	1.25	48.42	2.7	37.09	19.52
3.6	24.26	2.20	3.6	30.82	10.11	3.7	20.23	40.90	3.7	1.58	48.57	3.7	37.26	19.56
4.6	24.40	2.40	4.6	31.11	10.27	4.7	20.36	41.02	4.7	1.93	48.72	4.7	37.43	19.61
5.6	24.53	2.60	5.6	31.39	10.43	5.7	20.50	41.15	5.7	2.29	48.89	5.7	37.58	19.65
6.6	24.66	2.78	6.6	31.66	10.59	6.7	20.64	41.27	6.7	2.65	49.06	6.7	37.73	19.68
7.6	24.78	2.97	7.6	31.91	10.75	7.7	20.76	41.40	7.7	3.02	49.24	7.7	37.88	19.72
8.6	24.90	3.15	8.6	32.17	10.90	8.6	20.89	41.50	8.7	3.38	49.43	8.7	38.03	19.76
9.6	25.03	3.32	9.6	32.44	11.05	9.6	21.02	41.61	9.7	3.74	49.64	9.7	38.19	19.80
10.6	25.17	3.49	10.6	32.71	11.19	10.6	21.14	41.71	10.7	4.09	49.87	10.7	38.34	19.83
11.6	25.30	3.66	11.6	32.99	11.33	11.6	21.28	41.82	11.7	4.43	50.11	11.7	38.51	19.85
12.6	25.44	3.84	12.6	33.28	11.48	12.6	21.43	41.93	12.7	4.75	50.36	12.7	38.68	19.87
13.6	25.59	4.03	13.6	33.58	11.65	13.6	21.57	42.06	13.7	5.04	50.60	13.7	38.85	19.90
14.6	25.74	4.25	14.6	33.89	11.82	14.6	21.72	42.20	14.7	5.32	50.85	14.7	39.03	19.94
15.6	25.89	4.47	15.6	34.19	12.00	15.6	21.87	42.34	15.7	5.59	51.08	15.7	39.21	20.00
16.6	26.03	4.71	16.6	34.48	12.22	16.6	22.01	42.52	16.7	5.86	51.30	16.7	39.39	20.08
17.6	26.14	4.96	17.6	34.75	12.44	17.6	22.14	42.71	17.7	6.13	51.52	17.7	39.56	20.18
18.6	26.25	5.21	18.6	34.99	12.67	18.6	22.27	42.91	18.7	6.42	51.73	18.7	39.71	20.29
19.6	26.34	5.47	19.6	35.22	12.90	19.6	22.37	43.11	19.6	6.73	51.95	19.7	39.86	20.41
20.6	26.43	5.71	20.6	35.41	13.12	20.6	22.47	43.30	20.6	7.05	52.18	20.7	40.00	20.53
21.6	26.52	5.94	21.6	35.61	13.32	21.6	22.57	43.48	21.6	7.37	52.42	21.7	40.13	20.64
22.6	26.62	6.14	22.6	35.83	13.51	22.6	22.68	43.64	22.6	7.69	52.70	22.7	40.26	20.74
23.6	26.72	6.34	23.6	36.05	13.70	23.6	22.80	43.78	23.6	8.01	52.99	23.7	40.40	20.83
24.6	26.82	6.54	24.6	36.28	13.88	24.6	22.91	43.93	24.6	8.29	53.30	24.6	40.55	20.92
25.6	26.95	6.77	25.6	36.52	14.07	25.6	23.04	44.10	25.6	8.55	53.61	25.6	40.72	21.00
26.6	27.08	7.01	26.6	36.78	14.29	26.6	23.17	44.28	26.6	8.79	53.91	26.6	40.89	21.10
27.6	27.18	7.28	27.6	37.03	14.52	27.6	23.30	44.47	27.6	9.01	54.20	27.6	41.05	21.22
28.6	27.29	7.55	28.6	37.27	14.77	28.6	23.41	44.70	28.6	9.23	54.49	28.6	41.20	21.35
29.5	27.37	7.84	29.6	37.49	15.04	29.6	23.52	44.93	29.6	9.44	54.77	29.6	41.35	21.50
30.5	27.46	8.13	30.6	37.69	15.30	30.6	23.62	45.17	30.6	9.67	55.03	30.6	41.50	21.68
31.5	27.53	8.42	31.6	37.87	15.58	31.6	23.72	45.42	31.6	9.90	55.29	31.6	41.64	21.86
32.5	27.59	8.71	32.6	38.03	15.86	32.6	23.81	45.67	32.6	10.14	55.56	32.6	41.77	22.05
8.29	-8.22		15.72	-15.69		6.99	-6.92		18.38	+18.35		7.60	-7.53	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 0 58	° ' +85 50	Aug.	h m 1 34	° ' +88 53	Aug.	h m 1 41	° ' -85 9	Aug.	h m 4 11	° ' +85 20	Aug.	h m 5 37	° ' +85 9
	s	"		s	"		s	"		s	"		s	"
0.7	13.94	31.20	0.7	10.19	20.75	0.7	34.60	7.55	0.8	53.39	45.15	0.9	3.91	22.12
1.7	14.21	31.37	1.7	11.24	20.87	1.7	34.85	7.60	1.8	53.65	45.06	1.9	4.11	21.92
2.7	14.48	31.55	2.7	12.31	20.99	2.7	35.10	7.67	2.8	53.92	44.98	2.9	4.34	21.72
3.7	14.75	31.74	3.7	13.43	21.12	3.7	35.34	7.73	3.8	54.20	44.89	3.9	4.56	21.51
4.7	15.03	31.94	4.7	14.56	21.27	4.7	35.58	7.79	4.8	54.49	44.80	4.9	4.79	21.30
5.7	15.31	32.16	5.7	15.70	21.44	5.7	35.81	7.84	5.8	54.80	44.74	5.9	5.03	21.11
6.7	15.60	32.39	6.7	16.84	21.62	6.7	36.03	7.89	6.8	55.11	44.67	6.9	5.31	20.92
7.7	15.88	32.63	7.7	17.96	21.81	7.7	36.26	7.94	7.8	55.42	44.62	7.9	5.58	20.74
8.7	16.15	32.91	8.7	19.05	22.04	8.7	36.49	7.98	8.8	55.75	44.60	8.9	5.85	20.59
9.7	16.39	33.18	9.7	20.09	22.26	9.7	36.71	8.02	9.8	56.06	44.59	9.9	6.13	20.44
10.7	16.63	33.46	10.7	21.08	22.49	10.7	36.99	8.07	10.8	56.37	44.59	10.8	6.41	20.31
11.7	16.85	33.73	11.7	22.01	22.71	11.7	37.26	8.12	11.8	56.66	44.61	11.8	6.68	20.20
12.6	17.05	33.98	12.7	22.89	22.93	12.7	37.53	8.20	12.8	56.94	44.62	12.8	6.92	20.10
13.6	17.26	34.23	13.7	23.77	23.13	13.7	37.79	8.29	13.8	57.21	44.62	13.8	7.16	19.98
14.6	17.48	34.47	14.7	24.68	23.32	14.7	38.04	8.42	14.8	57.48	44.61	14.8	7.41	19.85
15.6	17.70	34.70	15.7	25.62	23.51	15.7	38.29	8.55	15.8	57.76	44.57	15.8	7.64	19.71
16.6	17.93	34.94	16.7	26.63	23.70	16.7	38.51	8.69	16.8	58.04	44.54	16.8	7.89	19.56
17.6	18.19	35.20	17.7	27.70	23.90	17.7	38.71	8.83	17.8	58.35	44.51	17.8	8.16	19.38
18.6	18.46	35.47	18.7	28.79	24.13	18.7	38.91	8.96	18.8	58.67	44.50	18.8	8.44	19.23
19.6	18.71	35.76	19.7	29.88	24.37	19.7	39.11	9.09	19.8	59.00	44.49	19.8	8.73	19.08
20.6	18.96	36.07	20.7	30.92	24.64	20.7	39.33	9.19	20.8	59.35	44.50	20.8	9.05	18.96
21.6	19.20	36.39	21.6	31.91	24.92	21.7	39.55	9.30	21.8	59.69	44.54	21.8	9.37	18.86
22.6	19.40	36.72	22.6	32.83	25.21	22.6	39.77	9.41	22.8	60.02	44.60	22.8	9.67	18.78
23.6	19.59	37.05	23.6	33.68	25.50	23.6	40.01	9.54	23.8	60.33	44.67	23.8	9.96	18.72
24.6	19.78	37.37	24.6	34.49	25.78	24.6	40.25	9.66	24.7	60.62	44.74	24.8	10.24	18.66
25.6	19.95	37.66	25.6	35.26	26.03	25.6	40.50	9.81	25.7	60.90	44.80	25.8	10.51	18.60
26.6	20.12	37.94	26.6	36.04	26.28	26.6	40.73	9.99	26.7	61.18	44.86	26.8	10.78	18.53
27.6	20.29	38.22	27.6	36.84	26.52	27.6	40.95	10.18	27.7	61.46	44.91	27.8	11.04	18.45
28.6	20.47	38.50	28.6	37.66	26.76	28.6	41.17	10.38	28.7	61.73	44.96	28.8	11.30	18.37
29.6	20.66	38.78	29.6	38.50	27.00	29.6	41.37	10.60	29.7	62.02	45.00	29.8	11.56	18.29
30.6	20.85	39.07	30.6	39.37	27.27	30.6	41.56	10.82	30.7	62.31	45.04	30.8	11.83	18.19
31.6	21.04	39.38	31.6	40.25	27.53	31.6	41.74	11.02	31.7	62.63	45.08	31.8	12.11	18.10
13.79	+13.76		51.61	+51.60		11.83	-11.79		12.32	+12.28		11.84	+11.80	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Aug.	5 44	-84 49	Aug.	6 46	-80 43	Aug.	7 4	+87 9	Aug.	7 13	-86 54	Aug.	7 14	+82 33
	s	"		s	"		s	"		s	"		s	"
0.9	47.11	33.99	0.9	19.61	63.87	0.9	44.54	63.74	0.9	47.99	50.96	0.9	54.29	34.60
1.9	47.27	33.74	1.9	19.67	63.56	1.9	44.76	63.46	1.9	48.11	50.65	1.9	54.37	34.32
2.9	47.43	33.50	2.9	19.73	63.27	2.9	44.98	63.17	2.9	48.24	50.36	2.9	54.45	34.03
3.9	47.59	33.26	3.9	19.80	62.99	3.9	45.23	62.87	3.9	48.38	50.07	3.9	54.53	33.74
4.9	47.74	33.03	4.9	19.86	62.71	4.9	45.50	62.58	4.9	48.52	49.79	4.9	54.63	33.45
5.9	47.89	32.81	5.9	19.93	62.43	5.9	45.78	62.28	5.9	48.65	49.52	5.9	54.74	33.14
6.9	48.04	32.58	6.9	19.98	62.17	6.9	46.10	61.99	6.9	48.77	49.25	6.9	54.85	32.85
7.9	48.19	32.36	7.9	20.04	61.90	7.9	46.42	61.70	7.9	48.89	48.97	7.9	54.98	32.56
8.9	48.33	32.12	8.9	20.10	61.61	8.9	46.76	61.42	8.9	49.01	48.68	8.9	55.12	32.28
9.9	48.49	31.88	9.9	20.16	61.33	9.9	47.13	61.16	9.9	49.13	48.39	9.9	55.26	32.03
10.8	48.65	31.63	10.9	20.22	61.02	10.9	47.50	60.92	10.9	49.26	48.07	10.9	55.40	31.78
11.8	48.82	31.38	11.9	20.29	60.71	11.9	47.85	60.69	11.9	49.39	47.76	11.9	55.53	31.54
12.8	48.99	31.12	12.9	20.37	60.40	12.9	48.19	60.46	12.9	49.56	47.44	12.9	55.66	31.32
13.8	49.18	30.88	13.9	20.45	60.11	13.9	48.52	60.23	13.9	49.75	47.12	13.9	55.77	31.11
14.8	49.38	30.65	14.9	20.53	59.82	14.9	48.81	60.00	14.9	49.95	46.82	14.9	55.88	30.87
15.8	49.58	30.45	15.9	20.62	59.55	15.9	49.11	59.76	15.9	50.18	46.53	15.9	55.99	30.62
16.8	49.78	30.27	16.9	20.71	59.31	16.9	49.42	59.50	16.9	50.40	46.27	16.9	56.11	30.35
17.8	49.97	30.13	17.9	20.81	59.08	17.9	49.75	59.23	17.9	50.63	46.03	17.9	56.24	30.07
18.8	50.16	29.98	18.9	20.90	58.87	18.9	50.11	58.95	18.9	50.85	45.80	18.9	56.38	29.80
19.8	50.34	29.82	19.9	20.99	58.65	19.9	50.51	58.67	19.9	51.05	45.57	19.9	56.53	29.52
20.8	50.52	29.65	20.9	21.07	58.42	20.9	50.93	58.42	20.9	51.24	45.34	20.9	56.69	29.25
21.8	50.70	29.48	21.9	21.15	58.19	21.9	51.37	58.18	21.9	51.43	45.09	21.9	56.85	29.01
22.8	50.88	29.29	22.9	21.23	57.94	22.9	51.81	57.96	22.9	51.62	44.82	22.9	57.02	28.78
23.8	51.07	29.09	23.9	21.31	57.69	23.9	52.24	57.76	23.9	51.84	44.55	23.9	57.18	28.58
24.8	51.29	28.90	24.9	21.41	57.42	24.9	52.65	57.57	24.9	52.07	44.27	24.9	57.34	28.38
25.8	51.51	28.72	25.9	21.51	57.17	25.9	53.03	57.38	25.9	52.32	43.99	25.9	57.48	28.19
26.8	51.73	28.55	26.8	21.61	56.93	26.9	53.41	57.20	26.9	52.59	43.72	26.9	57.62	28.00
27.8	51.96	28.40	27.8	21.73	56.69	27.9	53.77	57.01	27.9	52.88	43.47	27.9	57.76	27.80
28.8	52.20	28.26	28.8	21.84	56.47	28.9	54.14	56.81	28.9	53.18	43.22	28.9	57.90	27.59
29.8	52.43	28.13	29.8	21.96	56.27	29.9	54.50	56.58	29.9	53.49	42.98	29.9	58.04	27.37
30.8	52.66	28.01	30.8	22.07	56.09	30.9	54.88	56.36	30.9	53.80	42.77	30.9	58.18	27.14
31.8	52.89	27.93	31.8	22.18	55.92	31.8	55.28	56.14	31.9	54.10	42.58	31.9	58.33	26.92
11.09	-11.04		6.21	-6.13		20.23	+20.21		18.57	-18.54		7.72	+7.66	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 54'49		7 ^h 14 ^m	18° 1'85		7 ^h 14 ^m	59° 0'83	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m 8 20	° ' " +88 51	Aug.	h m 9 7	° ' " -85 21	Aug.	h m 9 26	° ' " +81 39	Aug.	h m 9 36	° ' " -80 35	Aug.	h m 10 21	° ' " +82 56
	s	"		s	"		s	"		s	"		s	"
0.9	47.18	38.68	1.0	53.86	42.14	1.0	6.71	59.78	1.0	6.71	62.71	1.1	40.09	62.18
1.9	47.38	38.36	2.0	53.82	41.82	2.0	6.70	59.47	2.0	6.67	62.39	2.1	40.03	61.88
2.9	47.60	38.03	3.0	53.78	41.51	3.0	6.69	59.15	3.0	6.64	62.08	3.1	39.97	61.57
3.9	47.85	37.70	4.0	53.75	41.20	4.0	6.68	58.82	4.0	6.63	61.79	4.1	39.91	61.25
4.9	48.12	37.33	5.0	53.72	40.91	5.0	6.68	58.48	5.0	6.61	61.49	5.1	39.86	60.93
5.9	48.45	36.98	6.0	53.70	40.62	6.0	6.68	58.13	6.0	6.58	61.21	6.1	39.82	60.59
6.9	48.84	36.63	7.0	53.67	40.33	7.0	6.69	57.77	7.0	6.55	60.93	7.1	39.78	60.23
7.9	49.29	36.28	8.0	53.64	40.04	8.0	6.72	57.41	8.0	6.52	60.64	8.1	39.75	59.87
8.9	49.80	35.94	8.9	53.61	39.75	9.0	6.75	57.04	9.0	6.49	60.35	9.1	39.74	59.50
9.9	50.35	35.60	9.9	53.57	39.44	10.0	6.79	56.70	10.0	6.47	60.06	10.0	39.74	59.15
10.9	50.91	35.28	10.9	53.51	39.12	11.0	6.83	56.36	11.0	6.44	59.74	11.0	39.74	58.81
11.9	51.48	34.97	11.9	53.47	38.79	12.0	6.87	56.05	12.0	6.40	59.40	12.0	39.74	58.48
12.9	52.01	34.69	12.9	53.44	38.45	13.0	6.91	55.74	13.0	6.37	59.07	13.0	39.73	58.16
13.9	52.50	34.40	13.9	53.43	38.11	13.9	6.95	55.43	14.0	6.36	58.71	14.0	39.73	57.85
14.9	52.96	34.10	14.9	53.43	37.76	14.9	6.96	55.12	15.0	6.35	58.36	15.0	39.72	57.54
15.9	53.37	33.79	15.9	53.46	37.42	15.9	6.97	54.81	15.9	6.35	58.03	16.0	39.69	57.23
16.9	53.81	33.46	16.9	53.50	37.10	16.9	6.99	54.47	16.9	6.35	57.71	17.0	39.67	56.89
17.9	54.28	33.12	17.9	53.55	36.81	17.9	7.02	54.11	17.9	6.35	57.42	18.0	39.65	56.53
18.9	54.82	32.77	18.9	53.59	36.52	18.9	7.05	53.75	18.9	6.36	57.12	19.0	39.63	56.17
19.9	55.45	32.41	19.9	53.63	36.25	19.9	7.09	53.37	19.9	6.37	56.84	20.0	39.63	55.78
20.9	56.14	32.08	20.9	53.65	35.97	20.9	7.14	52.99	20.9	6.37	56.56	21.0	39.64	55.39
21.9	56.89	31.76	21.9	53.66	35.67	21.9	7.20	52.64	21.9	6.38	56.25	22.0	39.67	55.01
22.9	57.66	31.45	22.9	53.68	35.36	22.9	7.28	52.30	22.9	6.38	55.94	23.0	39.70	54.63
23.9	58.42	31.16	23.9	53.69	35.03	23.9	7.36	51.96	23.9	6.38	55.62	24.0	39.73	54.29
24.9	59.16	30.88	24.9	53.73	34.70	24.9	7.42	51.63	24.9	6.38	55.28	25.0	39.77	53.95
25.9	59.85	30.60	25.9	53.77	34.36	25.9	7.47	51.32	25.9	6.38	54.95	26.0	39.80	53.62
26.9	60.51	30.33	26.9	53.83	34.02	26.9	7.53	51.02	26.9	6.40	54.60	27.0	39.81	53.30
27.9	61.15	30.06	27.9	53.89	33.68	27.9	7.58	50.72	27.9	6.43	54.25	27.9	39.82	52.98
28.9	61.78	29.77	28.9	53.98	33.34	28.9	7.63	50.41	28.9	6.45	53.91	28.9	39.84	52.64
29.9	62.42	29.47	29.9	54.07	33.02	29.9	7.68	50.10	29.9	6.47	53.58	29.9	39.85	52.30
30.9	63.08	29.18	30.9	54.18	32.73	30.9	7.73	49.76	30.9	6.51	53.26	30.9	39.86	51.95
31.9	63.77	28.87	31.9	54.28	32.44	31.9	7.79	49.41	31.9	6.55	52.96	31.9	39.87	51.58
50.24	+50.23		12.36	-12.32		6.90	+6.83		6.12	-6.04		8.15	+8.09	
8 ^h 21 ^m	41 ^s .998		9 ^h 8 ^m	8 ^s .703		9 ^h 26 ^m	14 ^s .295		9 ^h 36 ^m	12 ^s .346		10 ^h 21 ^m	50 ^s .081	
+88° 51'	51''.95		-85° 21'	25''.35		+81° 40'	7''.28		-80° 35'	44''.11		+82° 57'	4''.81	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Aug.	10 59	-84 11	Aug.	12 13	+88 7	Aug.	12 46	-84 42	Aug.	12 48	+83 49	Aug.	13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
1.1	48.32	10.71	1.1	51.02	43.79	1.2	46.55	45.58	1.2	22.92	63.55	1.2	17.08	58.70
2.1	48.19	10.46	2.1	50.51	43.57	2.2	46.35	45.43	2.2	22.75	63.38	2.2	16.84	58.61
3.1	48.08	10.19	3.1	50.00	43.35	3.2	46.16	45.28	3.2	22.58	63.20	3.2	16.60	58.51
4.1	47.97	9.94	4.1	49.48	43.11	4.2	45.97	45.13	4.2	22.41	63.01	4.2	16.37	58.41
5.1	47.87	9.69	5.1	48.96	42.84	5.2	45.79	44.99	5.2	22.23	62.81	5.2	16.14	58.31
6.1	47.77	9.45	6.1	48.47	42.57	6.2	45.61	44.85	6.2	22.05	62.58	6.2	15.92	58.23
7.1	47.66	9.22	7.1	47.99	42.29	7.2	45.43	44.72	7.2	21.90	62.36	7.2	15.70	58.17
8.1	47.55	8.99	8.1	47.53	42.00	8.2	45.25	44.60	8.2	21.75	62.11	8.2	15.48	58.09
9.1	47.44	8.76	9.1	47.11	41.69	9.2	45.07	44.48	9.2	21.60	61.84	9.2	15.25	58.01
10.1	47.31	8.52	10.1	46.72	41.38	10.1	44.88	44.36	10.1	21.46	61.57	10.2	15.01	57.93
11.1	47.18	8.26	11.1	46.36	41.09	11.1	44.67	41.22	11.1	21.33	61.30	11.2	14.76	57.85
12.1	47.05	7.99	12.1	46.02	40.80	12.1	44.47	44.05	12.1	21.20	61.06	12.2	14.50	57.76
13.1	46.94	7.68	13.1	45.68	40.52	13.1	44.26	43.88	13.1	21.08	60.81	13.2	14.23	57.64
14.1	46.83	7.37	14.1	45.32	40.25	14.1	44.06	43.68	14.1	20.95	60.57	14.2	13.98	57.50
15.1	46.74	7.06	15.1	44.95	39.98	15.1	43.86	43.46	15.1	20.82	60.34	15.2	13.73	57.34
16.1	46.65	6.76	16.1	44.54	39.71	16.1	43.68	43.24	16.1	20.67	60.11	16.2	13.49	57.17
17.1	46.59	6.47	17.1	44.12	39.43	17.1	43.52	43.04	17.1	20.51	59.87	17.2	13.28	57.00
18.1	46.53	6.19	18.1	43.68	39.12	18.1	43.38	42.83	18.1	20.36	59.60	18.2	13.08	56.84
19.1	46.48	5.93	19.1	43.24	38.80	19.1	43.24	42.64	19.1	20.21	59.32	19.2	12.90	56.69
20.0	46.42	5.67	20.1	42.83	38.46	20.1	43.10	42.15	20.1	20.06	59.03	20.1	12.72	56.54
21.0	46.36	5.41	21.1	42.47	38.09	21.1	42.95	42.27	21.1	19.92	58.71	21.1	12.52	56.41
22.0	46.28	5.15	22.1	42.15	37.73	22.1	42.79	42.09	22.1	19.80	58.39	22.1	12.31	56.28
23.0	46.19	4.87	23.1	41.88	37.39	23.1	42.62	41.90	23.1	19.69	58.07	23.1	12.09	56.14
24.0	46.11	4.58	24.1	41.63	37.05	24.1	42.44	41.70	24.1	19.59	57.76	24.1	11.86	55.97
25.0	46.03	4.26	25.1	41.39	36.72	25.1	42.27	41.48	25.1	19.49	57.47	25.1	11.63	55.79
26.0	45.96	3.94	26.1	41.15	36.41	26.1	42.09	41.24	26.1	19.39	57.18	26.1	11.40	55.60
27.0	45.90	3.61	27.1	40.89	36.11	27.1	41.93	40.98	27.1	19.29	56.91	27.1	11.17	55.38
28.0	45.85	3.27	28.1	40.61	35.80	28.1	41.78	40.71	28.1	19.18	56.63	28.1	10.95	55.16
29.0	45.81	2.93	29.1	40.32	35.49	29.1	41.63	40.44	29.1	19.07	56.35	29.1	10.75	54.93
30.0	45.78	2.60	30.1	40.01	35.17	30.1	41.49	40.16	30.1	18.94	56.06	30.1	10.56	54.70
31.0	45.76	2.28	31.1	39.70	34.85	31.1	41.36	39.89	31.1	18.82	55.77	31.1	10.38	54.47
32.0	45.75	1.95	32.1	39.41	34.51	32.1	41.26	39.62	32.1	18.70	55.46	32.1	10.21	54.24
9.87	-9.82		30.61	+30.59		10.85	-10.80		9.31	+9.26		12.47	-12.43	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10' 46".79			+88° 7' 36".40			-84° 42' 20".01			+83° 49' 52".98			-85° 23' 33".94		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "	Aug.	h m	° ' "
14 14	-83 19	"	15 1	+87 32	"	15 25	-84 13	"	16 53	+82 10	"	17 17	-80 47	"
1.2	32.00	23.95	1.3	31.56	5.73	1.3	30.90	3.16	1.3	49.52	20.71	1.4	13.86	36.13
2.2	31.82	23.91	2.3	31.05	5.74	2.3	30.70	3.22	2.3	49.38	20.88	2.4	13.77	36.32
3.2	31.65	23.87	3.3	30.52	5.75	3.3	30.50	3.28	3.3	49.23	21.06	3.4	13.68	36.50
4.2	31.48	23.84	4.3	29.97	5.75	4.3	30.31	3.32	4.3	49.08	21.23	4.3	13.59	36.68
5.2	31.33	23.81	5.3	29.41	5.72	5.3	30.13	3.37	5.3	48.93	21.38	5.3	13.51	36.85
6.2	31.18	23.79	6.3	28.86	5.68	6.3	29.95	3.43	6.3	48.77	21.53	6.3	13.43	37.03
7.2	31.03	23.76	7.3	28.30	5.63	7.3	29.78	3.50	7.3	48.60	21.67	7.3	13.35	37.20
8.2	30.87	23.75	8.2	27.74	5.57	8.3	29.61	3.57	8.3	48.43	21.78	8.3	13.27	37.38
9.2	30.70	23.74	9.2	27.18	5.48	9.3	29.43	3.64	9.3	48.27	21.89	9.3	13.20	37.57
10.2	30.53	23.73	10.2	26.65	5.38	10.3	29.25	3.71	10.3	48.10	21.97	10.3	13.12	37.78
11.2	30.36	23.70	11.2	26.13	5.28	11.3	29.06	3.78	11.3	47.95	22.05	11.3	13.03	37.98
12.2	30.18	23.65	12.2	25.65	5.18	12.3	28.84	3.85	12.3	47.79	22.11	12.3	12.93	38.18
13.2	29.99	23.59	13.2	25.16	5.08	13.3	28.62	3.90	13.3	47.63	22.19	13.3	12.82	38.38
14.2	29.80	23.50	14.2	24.68	5.00	14.2	28.39	3.94	14.3	47.48	22.27	14.3	12.69	38.54
15.2	29.61	23.39	15.2	24.18	4.93	15.2	28.18	3.94	15.3	47.32	22.36	15.3	12.57	38.69
16.2	29.44	23.28	16.2	23.66	4.87	16.2	27.97	3.93	16.3	47.17	22.46	16.3	12.46	38.82
17.2	29.28	23.17	17.2	23.11	4.80	17.2	27.77	3.89	17.3	46.99	22.57	17.3	12.35	38.93
18.2	29.14	23.06	18.2	22.55	4.72	18.2	27.59	3.86	18.3	46.83	22.68	18.3	12.24	39.03
19.2	28.99	22.95	19.2	21.97	4.63	19.2	27.41	3.85	19.3	46.65	22.78	19.3	12.15	39.14
20.2	28.86	22.86	20.2	21.39	4.51	20.2	27.24	3.84	20.3	46.48	22.85	20.3	12.06	39.26
21.2	28.71	22.78	21.2	20.82	4.37	21.2	27.07	3.84	21.3	46.30	22.91	21.3	11.97	39.39
22.2	28.57	22.71	22.2	20.29	4.21	22.2	26.89	3.85	22.3	46.12	22.95	22.3	11.88	39.53
23.2	28.40	22.62	23.2	19.77	4.04	23.2	26.70	3.86	23.3	45.94	22.98	23.3	11.77	39.67
24.2	28.23	22.53	24.2	19.29	3.87	24.2	26.50	3.86	24.3	45.77	22.99	24.3	11.67	39.81
25.2	28.05	22.40	25.2	18.81	3.72	25.2	26.27	3.85	25.3	45.62	23.00	25.3	11.55	39.95
26.2	27.87	22.27	26.2	18.34	3.56	26.2	26.05	3.81	26.3	45.46	23.02	26.3	11.42	40.08
27.2	27.69	22.12	27.2	17.87	3.42	27.2	25.82	3.75	27.3	45.29	23.05	27.3	11.28	40.18
28.2	27.52	21.95	28.2	17.40	3.29	28.2	25.60	3.69	28.3	45.12	23.08	28.3	11.14	40.27
29.2	27.36	21.77	29.2	16.91	3.15	29.2	25.39	3.60	29.3	44.96	23.11	29.3	11.01	40.34
30.2	27.21	21.59	30.2	16.41	3.02	30.2	25.19	3.50	30.3	44.78	23.14	30.3	10.88	40.40
31.2	27.06	21.40	31.2	15.91	2.88	31.2	24.99	3.40	31.3	44.60	23.17	31.3	10.75	40.46
32.1	26.92	21.21	32.2	15.39	2.74	32.2	24.79	3.30	32.3	44.42	23.21	32.3	10.62	40.50
8.60	-8.54		23.25	+23.23		9.93	-9.88		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m 23 ^s .692	15 ^h 1 ^m 45 ^s .970		15 ^h 25 ^m 17 ^s .036	16 ^h 53 ^m 48 ^s .037		17 ^h 17 ^m 1 ^s .936								
-83° 19'	1° 42'		+87° 31'	46° 68'		-84° 12'	45° 34'		+82° 9'	58° 64'		-80° 47'	29° 50'	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Aug.	17 57	+86 37	Aug.	18 10	-87 39	Aug.	18 55	+89 1	Aug.	19 38	-89 12	Aug.	20 48	+82 15
	s	"		s	"		s	"		s	"		s	"
1.4	12.24	11.52	1.4	30.42	49.93	1.4	66.85	51.62	1.5	63.63	33.12	1.5	25.96	2.85
2.4	11.97	11.75	2.4	30.13	50.17	2.4	66.16	51.91	2.5	63.30	33.41	2.5	25.95	3.20
3.4	11.69	11.99	3.4	29.84	50.41	3.4	65.45	52.20	3.4	62.95	33.71	3.5	25.94	3.56
4.4	11.40	12.23	4.4	29.55	50.65	4.4	64.68	52.51	4.4	62.60	33.99	4.5	25.93	3.92
5.4	11.08	12.47	5.4	29.27	50.88	5.4	63.85	52.81	5.4	62.26	34.28	5.5	25.92	4.29
6.4	10.76	12.70	6.4	29.02	51.11	6.4	62.97	53.10	6.4	61.96	34.56	6.5	25.89	4.67
7.4	10.43	12.93	7.4	28.77	51.34	7.4	62.02	53.39	7.4	61.68	34.84	7.5	25.86	5.05
8.4	10.09	13.13	8.4	28.52	51.58	8.4	61.02	53.68	8.4	61.44	35.12	8.5	25.83	5.43
9.4	9.73	13.33	9.4	28.27	51.83	9.4	59.99	53.93	9.4	61.20	35.41	9.5	25.79	5.79
10.4	9.37	13.51	10.4	28.01	52.10	10.4	58.92	54.17	10.4	60.96	35.73	10.5	25.74	6.14
11.4	9.03	13.66	11.4	27.73	52.37	11.4	57.88	54.40	11.4	60.65	36.05	11.5	25.68	6.48
12.4	8.69	13.81	12.4	27.41	52.64	12.4	56.87	54.62	12.4	60.27	36.37	12.5	25.63	6.81
13.4	8.36	13.96	13.4	27.06	52.89	13.4	55.89	54.84	13.4	59.76	36.69	13.5	25.58	7.13
14.4	8.03	14.13	14.4	26.68	53.14	14.4	54.96	55.07	14.4	59.16	37.01	14.5	25.53	7.45
15.4	7.71	14.31	15.4	26.27	53.36	15.4	54.07	55.31	15.4	58.46	37.30	15.5	25.49	7.78
16.3	7.39	14.49	16.4	25.87	53.56	16.4	53.14	55.56	16.4	57.72	37.57	16.5	25.44	8.11
17.3	7.06	14.69	17.4	25.49	53.75	17.4	52.17	55.83	17.4	56.99	37.84	17.5	25.40	8.47
18.3	6.69	14.89	18.4	25.12	53.92	18.4	51.12	56.10	18.4	56.30	38.08	18.5	25.35	8.84
19.3	6.32	15.09	19.3	24.78	54.10	19.4	50.00	56.37	19.4	55.67	38.33	19.5	25.30	9.22
20.3	5.91	15.27	20.3	24.45	54.28	20.4	48.80	56.62	20.4	55.10	38.58	20.5	25.24	9.60
21.3	5.50	15.41	21.3	24.13	54.47	21.4	47.55	56.86	21.4	54.55	38.85	21.5	25.16	9.97
22.3	5.10	15.55	22.3	23.80	54.67	22.4	46.28	57.08	22.4	54.01	39.12	22.4	25.08	10.31
23.3	4.71	15.66	23.3	23.44	54.88	23.4	45.03	57.28	23.4	53.41	39.40	23.4	25.00	10.65
24.3	4.32	15.77	24.3	23.06	55.09	24.4	43.81	57.47	24.4	52.72	39.69	24.4	24.92	10.96
25.3	3.95	15.87	25.3	22.64	55.30	25.4	42.64	57.65	25.4	51.94	39.98	25.4	24.84	11.25
26.3	3.59	15.97	26.3	22.18	55.49	26.4	41.52	57.83	26.4	51.06	40.27	26.4	24.75	11.55
27.3	3.23	16.08	27.3	21.71	55.68	27.4	40.40	58.02	27.4	50.10	40.56	27.4	24.67	11.86
28.3	2.87	16.20	28.3	21.22	55.84	28.4	39.29	58.21	28.4	49.08	40.81	28.4	24.61	12.17
29.3	2.51	16.33	29.3	20.73	55.99	29.4	38.19	58.41	29.4	48.02	41.06	29.4	24.53	12.49
30.3	2.13	16.46	30.3	20.25	56.13	30.3	37.05	58.61	30.4	46.95	41.31	30.4	24.45	12.81
31.3	1.75	16.59	31.3	19.78	56.26	31.3	35.89	58.83	31.4	45.87	41.53	31.4	24.38	13.14
32.3	1.36	16.72	32.3	19.31	56.37	32.3	34.67	59.05	32.4	44.82	41.75	32.4	24.30	13.47
16.96	+16.93		24.54	-24.52		59.19	+59.18		72.56	-72.56		7.42	+7.35	
17 ^h 57 ^m	4 ^s .326		18 ^h 9 ^m	46 ^s .186		18 ^h 55 ^m	23 ^s .393		19 ^h 37 ^m	1 ^s .735		20 ^h 48 ^m	15 ^s .385	
+86° 36'	50'' .43		-87° 39'	48'' .39		+89° 1'	32'' .83		-89° 12'	41'' .41		+82° 14'	50'' .67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Aug. 21 39	-83 4		Aug. 22 17	-86 21		Aug. 22 38	-81 46		Aug. 23 28	+86 52		Aug. 23 47	-82 26	
s	"		s	"		s	"		s	"		s	"	
1.5 27.59	8.71	1.6	38.03	15.86	1.6	23.81	45.67	1.6	10.14	55.56	1.6	41.77	22.05	
2.5 27.64	9.00	2.6	38.18	16.13	2.6	23.89	45.93	2.6	10.39	55.83	2.6	41.90	22.24	
3.5 27.69	9.27	3.6	38.33	16.41	3.6	23.96	46.17	3.6	10.64	56.11	3.6	42.01	22.43	
4.5 27.74	9.55	4.6	38.47	16.66	4.6	24.04	46.41	4.6	10.89	56.42	4.6	42.13	22.62	
5.5 27.79	9.82	5.6	38.60	16.91	5.6	24.12	46.65	5.6	11.15	56.73	5.6	42.25	22.80	
6.5 27.84	10.08	6.6	38.74	17.16	6.6	24.20	46.87	6.6	11.39	57.05	6.6	42.37	22.98	
7.5 27.90	10.33	7.6	38.88	17.41	7.6	24.28	47.09	7.6	11.62	57.39	7.6	42.49	23.15	
8.5 27.97	10.60	8.5	39.04	17.65	8.6	24.36	47.31	8.6	11.82	57.74	8.6	42.61	23.31	
9.5 28.03	10.86	9.5	39.21	17.91	9.6	24.45	47.54	9.6	12.00	58.09	9.6	42.74	23.48	
10.5 28.10	11.14	10.5	39.39	18.18	10.6	24.55	47.78	10.6	12.15	58.44	10.6	42.87	23.66	
11.5 28.16	11.44	11.5	39.56	18.46	11.6	24.65	48.04	11.6	12.29	58.78	11.6	43.01	23.84	
12.5 28.22	11.75	12.5	39.71	18.75	12.6	24.74	48.31	12.6	12.43	59.11	12.6	43.15	24.06	
13.5 28.27	12.07	13.5	39.85	19.07	13.5	24.81	48.61	13.6	12.57	59.42	13.6	43.28	24.28	
14.5 28.30	12.40	14.5	39.96	19.39	14.5	24.87	48.91	14.6	12.72	59.73	14.6	43.38	24.53	
15.5 28.32	12.72	15.5	40.06	19.71	15.5	24.93	49.21	15.6	12.90	60.03	15.6	43.48	24.79	
16.5 28.33	13.02	16.5	40.12	20.00	16.5	24.97	49.50	16.6	13.08	60.35	16.6	43.58	25.04	
17.5 28.34	13.30	17.5	40.17	20.29	17.5	25.01	49.78	17.6	13.28	60.68	17.6	43.67	25.28	
18.5 28.34	13.58	18.5	40.22	20.58	18.5	25.05	50.05	18.6	13.47	61.04	18.6	43.75	25.52	
19.5 28.35	13.85	19.5	40.28	20.85	19.5	25.10	50.29	19.6	13.65	61.41	19.6	43.84	25.74	
20.5 28.38	14.11	20.5	40.37	21.11	20.5	25.15	50.53	20.6	13.81	61.79	20.6	43.94	25.95	
21.5 28.41	14.38	21.5	40.45	21.38	21.5	25.21	50.78	21.6	13.95	62.17	21.6	44.03	26.17	
22.5 28.44	14.66	22.5	40.55	21.66	22.5	25.26	51.05	22.6	14.06	62.56	22.6	44.13	26.39	
23.5 28.47	14.97	23.5	40.65	21.95	23.5	25.33	51.33	23.6	14.15	62.93	23.6	44 21	26.61	
24.5 28.48	15.28	24.5	40.75	22.26	24.5	25.39	51.62	24.6	14.23	63.30	24.6	44.35	26.86	
25.5 28.49	15.60	25.5	40.82	22.58	25.5	25.44	51.93	25.5	14.30	63.64	25.6	44.44	27.14	
26.5 28.49	15.94	26.5	40.87	22.92	26.5	25.47	52.26	26.5	14.37	63.97	26.6	44.53	27.42	
27.5 28.48	16.27	27.5	40.88	23.26	27.5	25.50	52.59	27.5	14.45	64.30	27.6	44.61	27.72	
28.5 28.44	16.60	28.5	40.89	23.60	28.5	25.51	52.91	28.5	14.54	64.63	28.6	44.68	28.02	
29.5 28.40	16.92	29.5	40.89	23.93	29.5	25.53	53.23	29.5	14.64	64.96	29.6	44.74	28.32	
30.5 28.36	17.23	30.5	40.88	24.25	30.5	25.53	53.55	30.5	14.74	65.32	30.5	44.79	28.61	
31.5 28.32	17.52	31.5	40.85	24.57	31.5	25.53	53.87	31.5	14.85	65.68	31.5	44.84	28.90	
32.5 28.29	17.81	32.5	40.82	24.88	32.5	25.54	54.16	32.5	14.96	66.05	32.5	44.89	29.21	
8.29	-8.23	15.73	-15.70	6.99	-6.92	18.39	+18.37	7.60	-7.53					
21 ^h 39 ^m 16 ^s .433		22 ^h 17 ^m 21 ^s .969		22 ^h 38 ^m 16 ^s .769		23 ^h 27 ^m 42 ^s .388		23 ^h 47 ^m 38 ^s .028						
-83° 4' 28".91		-86° 21' 38".42		-81° 47' 9".68		+86° 52' 58".09		-82° 26' 48".40						

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '	Sept.	h m	° '
	0 58	+85 50		1 34	+88 53		1 41	-85 9		4 12	+85 20		5 37	+85 9
	s	"		s	"		s	"		s	"		s	"
0.6	21.04	39.38	0.6	40.25	27.53	0.6	41.74	11.02	0.7	2.63	45.08	0.8	12.11	18.10
1.6	21.24	39.69	1.6	41.15	27.80	1.6	41.92	11.23	1.7	2.93	45.14	1.8	12.40	18.01
2.6	21.45	40.02	2.6	42.05	28.08	2.6	42.09	11.44	2.7	3.26	45.20	2.8	12.71	17.92
3.6	21.64	40.36	3.6	42.94	28.38	3.6	42.27	11.63	3.7	3.58	45.27	3.8	13.03	17.87
4.6	21.83	40.70	4.6	43.79	28.70	4.6	42.45	11.82	4.7	3.90	45.36	4.8	13.34	17.82
5.6	22.00	41.06	5.6	44.58	29.03	5.6	42.62	12.01	5.7	4.22	45.48	5.8	13.67	17.79
6.6	22.15	41.43	6.6	45.31	29.36	6.6	42.81	12 20	6.7	4.54	45.61	6.8	13.99	17.78
7.6	22.29	41.80	7.6	45.99	29.70	7.6	43.01	12.39	7.7	4.84	45.75	7.8	14.30	17.77
8.6	22.42	42.15	8.6	46.62	30.03	8.6	43.20	12 61	8.7	5.13	45.89	8.8	14.59	17.77
9.6	22.52	42.48	9.6	47.22	30.35	9.6	43.40	12.83	9.7	5.41	46.02	9.8	14.88	17.77
10.6	22.63	42.81	10.6	47.81	30.64	10.6	43.60	13.08	10.7	5.68	46.15	10.8	15.16	17.77
11.6	22.76	43.12	11.6	48.45	30.93	11.6	43.75	13.35	11.7	5.95	46.25	11.8	15.43	17.74
12.6	22.90	43.44	12.6	49.15	31.22	12.6	43.91	13.62	12.7	6.23	46.35	12.8	15.70	17.71
13.6	23.06	43.76	13.6	49.89	31.51	13.6	44.05	13.90	13.7	6.51	46.45	13.8	16.00	17.67
14.6	23.22	44.10	14.6	50.67	31.83	14.6	44.17	14.17	14.7	6.83	46.55	14.8	16.31	17.64
15.6	23.38	44.47	15.6	51.46	32.16	15.6	44.29	14.42	15.7	7.15	46.68	15.7	16.63	17.62
16.6	23.54	44.85	16.6	52.22	32.52	16.6	44.42	14.67	16.7	7.48	46.81	16.7	16.96	17.61
17.6	23.68	45.26	17.6	52.92	32.89	17.6	44.54	14.91	17.7	7.81	46.98	17.7	17.30	17.61
18.5	23.80	45.65	18.6	53.54	33.26	18.6	44.68	15.15	18.7	8.13	47.15	18.7	17.64	17.65
19.5	23.90	46.04	19.6	54.07	33.63	19.6	44.82	15.39	19.7	8.42	47.34	19.7	17.96	17.70
20.5	23.98	46.42	20.6	54.55	34.00	20.6	44.97	15.63	20.7	8.71	47.53	20.7	18.28	17.75
21.5	24.04	46.78	21.6	55.00	34.34	21.6	45.13	15.90	21.7	8.97	47.71	21.7	18.56	17.81
22.5	24.11	47.14	22.6	55.43	34.68	22.6	45.27	16.18	22.7	9.24	47.90	22.7	18.85	17.86
23.5	24.18	47.48	23.6	55.88	35.01	23.6	45.41	16.50	23.7	9.48	48.08	23.7	19.12	17.91
24.5	24.25	47.83	24.6	56.33	35.33	24.6	45.52	16.82	24.7	9.73	48.25	24.7	19.40	17.95
25.5	24.33	48.17	25.6	56.80	35.65	25.6	45.63	17.14	25.7	9.98	48.40	25.7	19.67	18.00
26.5	24.41	48.51	26.6	57.31	35.97	26.6	45.72	17.46	26.7	10.25	48.56	26.7	19.95	18.04
27.5	24.50	48.85	27.5	57.82	36.30	27.6	45.81	17.77	27.7	10.52	48.72	27.7	20.24	18.07
28.5	24.59	49.21	28.5	58.35	36.63	28.5	45.87	18.08	28.7	10.80	48.89	28.7	20.54	18.09
29.5	24.69	49.58	29.5	58.87	36.99	29.5	45.94	18.39	29.6	11.08	49.07	29.7	20.85	18.13
30.5	24.77	49.96	30.5	59.38	37.35	30.5	46.01	18.69	30.6	11.37	49.25	30.7	21.16	18.19
31.5	24.85	50.34	31.5	59.86	37.72	31.5	46.08	18.98	31.6	11.66	49.45	31.7	21.48	18.27
13.80	+13.77		51.73	+51.72		11.84	-11.80		12.33	+12.29		11.84	+11.80	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 5 44	° ' -84 49	Sept.	h m 6 46	° ' -80 43	Sept.	h m 7 4	° ' +87 9	Sept.	h m 7 13	° ' -86 54	Sept.	h m 7 14	° ' +82 33
	s "	"		s "	"		s "	"		s "	"		s "	"
0.8	52.89	27.93	0.8	22.18	55.92	0.8	55.28	56.14	0.9	54.10	42.58	0.9	58.33	26.92
1.8	53.11	27.84	1.8	22.29	55.76	1.8	55.70	55.94	1.9	54.41	42.39	1.9	58.48	26.70
2.8	53.34	27.76	2.8	22.40	55.59	2.8	56.13	55.73	2.8	54.70	42.21	2.9	58.65	26.48
3.8	53.54	27.67	3.8	22.51	55.43	3.8	56.59	55.52	3.8	54.99	42.02	3.8	58.83	26.26
4.8	53.75	27.57	4.8	22.63	55.26	4.8	57.06	55.32	4.8	55.26	41.84	4.8	59.01	26.06
5.8	53.96	27.46	5.8	22.74	55.10	5.8	57.57	55.13	5.8	55.54	41.64	5.8	59.19	25.86
6.8	54.18	27.35	6.8	22.84	54.92	6.8	58.06	54.97	6.8	55.82	41.44	6.8	59.38	25.69
7.8	54.40	27.25	7.8	22.95	54.73	7.8	58.54	54.83	7.8	56.11	41.21	7.8	59.56	25.54
8.8	54.63	27.14	8.8	23.08	54.53	8.8	59.00	54.70	8.8	56.42	40.99	8.8	59.75	25.40
9.8	54.87	27.04	9.8	23.20	54.35	9.8	59.44	54.57	9.8	56.75	40.77	9.8	59.92	25.26
10.8	55.12	26.97	10.8	23.33	54.19	10.8	59.87	54.44	10.8	57.11	40.57	10.8	60.08	25.11
11.8	55.38	26.91	11.8	23.46	54.04	11.8	60.30	54.29	11.8	57.48	40.39	11.8	60.23	24.94
12.8	55.63	26.87	12.8	23.59	53.93	12.8	60.73	54.12	12.8	57.85	40.24	12.8	60.40	24.77
13.8	55.87	26.86	13.8	23.72	53.83	13.8	61.18	53.95	13.8	58.22	40.10	13.8	60.57	24.59
14.8	56.10	26.86	14.8	23.84	53.74	14.8	61.64	53.77	14.8	58.56	39.99	14.8	60.75	24.41
15.8	56.33	26.85	15.8	23.97	53.66	15.8	62.14	53.59	15.8	58.91	39.88	15.8	60.93	24.23
16.7	56.55	26.85	16.8	24.10	53.58	16.8	62.66	53.43	16.8	59.24	39.77	16.8	61.13	24.05
17.7	56.77	26.84	17.8	24.22	53.48	17.8	63.19	53.29	17.8	59.56	39.66	17.8	61.33	23.89
18.7	56.99	26.81	18.8	24.34	53.39	18.8	63.72	53.15	18.8	59.88	39.53	18.8	61.55	23.74
19.7	57.22	26.77	19.8	24.46	53.29	19.8	64.26	53.05	19.8	60.21	39.39	19.8	61.75	23.63
20.7	57.46	26.72	20.8	24.59	53.16	20.8	64.78	52.96	20.8	60.57	39.24	20.8	61.95	23.53
21.7	57.70	26.70	21.8	24.72	53.04	21.8	65.26	52.88	21.8	60.93	39.08	21.8	62.14	23.43
22.7	57.95	26.69	22.8	24.86	52.94	22.8	65.73	52.82	22.8	61.31	38.93	22.8	62.32	23.33
23.7	58.21	26.69	23.8	24.99	52.85	23.8	66.19	52.74	23.8	61.72	38.80	23.8	62.50	23.24
24.7	58.46	26.71	24.8	25.13	52.79	24.8	66.65	52.65	24.8	62.13	38.70	24.8	62.67	23.14
25.7	58.72	26.75	25.8	25.28	52.75	25.8	67.10	52.55	25.8	62.55	38.60	25.8	62.84	23.03
26.7	58.97	26.81	26.8	25.42	52.72	26.8	67.56	52.45	26.8	62.96	38.53	26.8	63.01	22.90
27.7	59.22	26.89	27.8	25.57	52.71	27.8	68.03	52.35	27.8	63.38	38.47	27.8	63.19	22.78
28.7	59.45	26.97	28.8	25.70	52.70	28.8	68.51	52.25	28.8	63.79	38.42	28.8	63.37	22.66
29.7	59.69	27.04	29.8	25.84	52.69	29.8	69.01	52.14	29.8	64.18	38.37	29.8	63.57	22.53
30.7	59.92	27.12	30.8	25.98	52.69	30.8	69.54	52.05	30.8	64.56	38.33	30.8	63.77	22.43
31.7	60.15	27.18	31.8	26.11	52.68	31.8	70.08	51.97	31.8	64.93	38.29	31.8	63.98	22.34
11.09	-11.04		6.21	-6.13		20.22	+20.19		18.56	-18.53		7.72	+7.65	
5 ^h 45 ^m	4° 7'00"		6 ^h 46 ^m	28° 8'50"		7 ^h 4 ^m	58° 5'49"		7 ^h 14 ^m	18° 1'85"		7 ^h 14 ^m	59° 0'83"	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Sept.	8 21	+88 51	Sept.	9 7	-85 21	Sept.	9 26	+81 39	Sept.	9 36	-80 35	Sept.	10 21	+82 56
	s	"		s	"		s	"		s	"		s	"
0.9	3.77	28.87	0.9	54.28	32.44	0.9	7.79	49.41	0.9	6.55	52.96	0.9	39.87	51.58
1.9	4.50	28.56	1.9	54.39	32.16	1.9	7.85	49.06	1.9	6.59	52.66	1.9	39.91	51.21
2.9	5.29	28.25	2.9	54.49	31.88	2.9	7.91	48.71	2.9	6.63	52.37	2.9	39.94	50.84
3.9	6.12	27.94	3.9	54.59	31.61	3.9	7.99	48.35	3.9	6.67	52.08	3.9	39.98	50.46
4.9	7.00	27.65	4.9	54.68	31.33	4.9	8.08	48.01	4.9	6.71	51.80	4.9	40.03	50.07
5.9	7.94	27.37	5.9	54.77	31.06	5.9	8.18	47.68	5.9	6.74	51.51	5.9	40.09	49.69
6.9	8.91	27.11	6.9	54.86	30.77	6.9	8.28	47.34	6.9	6.77	51.22	6.9	40.16	49.32
7.9	9.89	26.87	7.9	54.94	30.46	7.9	8.39	47.04	7.9	6.81	50.91	7.9	40.23	48.98
8.9	10.83	26.63	8.9	55.04	30.15	8.9	8.49	46.74	8.9	6.85	50.59	8.9	40.30	48.64
9.9	11.76	26.40	9.9	55.14	29.84	9.9	8.58	46.44	9.9	6.89	50.26	9.9	40.37	48.31
10.9	12.60	26.16	10.9	55.28	29.53	10.9	8.67	46.15	10.9	6.94	49.93	10.9	40.43	47.99
11.9	13.42	25.90	11.9	55.42	29.23	11.9	8.75	45.87	11.9	6.99	49.61	11.9	40.48	47.66
12.9	14.23	25.64	12.9	55.59	28.95	12.9	8.82	45.55	12.9	7.05	49.32	12.9	40.52	47.32
13.9	15.08	25.38	13.9	55.76	28.70	13.9	8.89	45.22	13.9	7.12	49.04	13.9	40.57	46.96
14.9	15.97	25.10	14.9	55.92	28.46	14.9	8.98	44.88	14.9	7.19	48.77	14.9	40.62	46.59
15.9	16.93	24.82	15.9	56.08	28.24	15.9	9.08	44.54	15.9	7.26	48.53	15.9	40.68	46.21
16.9	17.95	24.54	16.9	56.23	28.02	16.9	9.19	44.19	16.9	7.33	48.29	16.9	40.76	45.82
17.9	19.05	24.27	17.9	56.37	27.79	17.9	9.31	43.85	17.9	7.40	48.04	17.9	40.85	45.43
18.9	20.16	24.03	18.9	56.51	27.55	18.9	9.43	43.53	18.9	7.47	47.78	18.9	40.95	45.06
19.8	21.27	23.81	19.9	56.65	27.29	19.9	9.56	43.24	19.9	7.53	47.52	19.9	41.05	44.71
20.8	22.36	23.61	20.9	56.80	27.02	20.9	9.68	42.95	20.9	7.58	47.25	20.9	41.15	44.37
21.8	23.43	23.41	21.9	56.95	26.75	21.9	9.79	42.67	21.9	7.66	46.96	21.9	41.26	44.05
22.8	24.45	23.22	22.9	57.13	26.48	22.9	9.90	42.40	22.9	7.74	46.67	22.9	41.35	43.73
23.8	25.43	23.03	23.9	57.31	26.21	23.9	10.00	42.14	23.9	7.82	46.38	23.9	41.43	43.41
24.8	26.39	22.84	24.9	57.51	25.96	24.9	10.11	41.87	24.9	7.90	46.11	24.9	41.52	43.10
25.8	27.34	22.64	25.9	57.72	25.72	25.9	10.21	41.60	25.9	7.98	45.84	25.9	41.61	42.78
26.8	28.30	22.43	26.9	57.94	25.50	26.9	10.31	41.32	26.9	8.08	45.60	26.9	41.69	42.46
27.8	29.30	22.21	27.9	58.16	25.30	27.9	10.42	41.04	27.9	8.18	45.36	27.9	41.77	42.13
28.8	30.32	21.99	28.9	58.39	25.11	28.9	10.53	40.75	28.9	8.28	45.13	28.9	41.86	41.79
29.8	31.39	21.77	29.9	58.60	24.93	29.9	10.65	40.45	29.9	8.38	44.93	29.9	41.95	41.44
30.8	32.51	21.55	30.9	58.80	24.75	30.9	10.78	40.16	30.9	8.47	44.72	30.9	42.05	41.09
31.8	33.67	21.35	31.8	59.01	24.58	31.9	10.91	39.86	31.9	8.56	44.53	31.9	42.16	40.74
50.13	+50.12		12.36	-12.32		6.90	+6.82		6.12	-6.04		8.14	+8.08	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Sept.	10 59	-84 10	Sept.	12 13	+88 7	Sept.	12 46	-84 42	Sept.	12 48	+83 49	Sept.	13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
1.0	45.75	61.95	1.1	39.41	34.51	1.1	41.26	39.62	1.1	18.70	55.46	1.1	10.21	54.24
2.0	45.74	61.65	2.1	39.12	34.15	2.1	41.15	39.35	2.1	18.59	55.15	2.1	10.04	54.01
3.0	45.72	61.36	3.1	38.84	33.79	3.1	41.05	39.11	3.1	18.48	54.82	3.1	9.89	53.79
4.0	45.71	61.07	4.1	38.59	33.42	4.1	40.94	38.86	4.1	18.37	54.47	4.1	9.73	53.57
5.0	45.69	60.79	5.1	38.37	33.04	5.1	40.83	38.61	5.1	18.27	54.11	5.1	9.58	53.37
6.0	45.68	60.49	6.1	38.19	32.66	6.1	40.72	38.36	6.1	18.18	53.75	6.1	9.40	53.16
6.9	45.65	60.18	7.0	38.05	32.27	7.1	40.59	38.12	7.1	18.12	53.39	7.1	9.22	52.94
7.9	45.62	59.87	8.0	37.94	31.90	8.1	40.46	37.86	8.1	18.05	53.04	8.1	9.04	52.72
8.9	45.59	59.54	9.0	37.83	31.55	9.1	40.33	37.58	9.1	17.99	52.70	9.1	8.86	52.48
9.9	45.58	59.20	10.0	37.71	31.21	10.1	40.21	37.29	10.1	17.93	52.37	10.1	8.67	52.22
10.9	45.58	58.85	11.0	37.58	30.87	11.1	40.10	36.98	11.1	17.85	52.04	11.1	8.49	51.95
11.9	45.59	58.50	12.0	37.42	30.54	12.1	40.00	36.67	12.1	17.77	51.72	12.1	8.34	51.66
12.9	45.62	58.17	13.0	37.24	30.18	13.1	39.93	36.35	13.1	17.68	51.40	13.1	8.20	51.37
13.9	45.66	57.85	14.0	37.04	29.82	14.1	39.87	36.04	14.1	17.59	51.07	14.1	8.09	51.09
14.9	45.71	57.55	15.0	36.83	29.45	15.1	39.81	35.75	15.1	17.50	50.71	15.1	7.98	50.81
15.9	45.75	57.26	16.0	36.64	29.04	16.0	39.76	35.47	16.0	17.41	50.33	16.1	7.89	50.56
16.9	45.80	56.99	17.0	36.51	28.63	17.0	39.71	35.20	17.0	17.34	49.94	17.1	7.79	50.31
17.9	45.84	56.72	18.0	36.42	28.22	18.0	39.66	34.94	18.0	17.28	49.55	18.1	7.68	50.07
18.9	45.87	56.44	19.0	36.38	27.81	19.0	39.60	34.67	19.0	17.23	49.16	19.1	7.55	49.83
19.9	45.88	56.13	20.0	36.37	27.43	20.0	39.52	34.39	20.0	17.20	48.76	20.1	7.43	49.56
20.9	45.91	55.81	21.0	36.38	27.04	21.0	39.44	34.10	21.0	17.17	48.38	21.1	7.30	49.29
21.9	45.94	55.49	22.0	36.39	26.67	22.0	39.35	33.78	22.0	17.14	48.01	22.1	7.16	49.00
22.9	45.98	55.15	23.0	36.39	26.33	23.0	39.29	33.46	23.0	17.11	47.67	23.1	7.03	48.68
23.9	46.03	54.81	24.0	36.38	25.98	24.0	39.23	33.12	24.0	17.07	47.33	24.1	6.92	48.37
24.9	46.09	54.48	24.9	36.34	25.63	25.0	39.18	32.78	25.0	17.03	46.99	25.0	6.82	48.04
25.9	46.15	54.15	25.9	36.31	25.27	26.0	39.14	32.44	26.0	16.98	46.65	26.0	6.73	47.71
26.9	46.24	53.83	26.9	36.26	24.91	27.0	39.13	32.10	27.0	16.94	46.30	27.0	6.65	47.38
27.9	46.33	53.52	27.9	36.21	24.54	28.0	39.11	31.77	28.0	16.90	45.94	28.0	6.59	47.06
28.9	46.43	53.23	28.9	36.16	24.16	29.0	39.11	31.45	29.0	16.85	45.58	29.0	6.54	46.73
29.9	46.53	52.95	29.9	36.14	23.78	30.0	39.11	31.14	30.0	16.80	45.20	30.0	6.49	46.43
30.9	46.62	52.68	30.9	36.14	23.37	31.0	39.12	30.85	31.0	16.77	44.79	31.0	6.45	46.13
31.9	46.71	52.42	31.9	36.17	22.97	32.0	39.12	30.55	32.0	16.76	44.39	32.0	6.41	45.85
9.87	-9.81		30.56	+30.54		10.85	-10.80		9.31	+9.25		12.46	-12.42	
10 ^h 59 ^m	53° 03.6		12 ^h 14 ^m	30° 80.2		12 ^h 46 ^m	43° 16.1		12 ^h 48 ^m	33° 11.1		13 ^h 28 ^m	9° 62.8	
-84° 10'	46'' 79		+88° 7'	36'' 40		-84° 42'	20'' 01		+83° 49'	52'' 98		-85° 23'	33'' 94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ε Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Sept.	h m 14 14	° ' -83 19	Sept.	h m 15 1	° ' +87 31	Sept.	h m 15 25	° ' -84 12	Sept.	h m 16 53	° ' +82 10	Sept.	h m 17 17	° ' -80 47
	s "	"		s "	"		s "	"		s "	"		s "	"
1.1	26.92	21.21	1.2	15.39	62.74	1.2	24.79	63.30	1.3	44.42	23.21	1.3	10.62	40.50
2.1	26.78	21.02	2.2	14.86	62.57	2.2	24.61	63.20	2.3	44.24	23.24	2.3	10.51	40.53
3.1	26.65	20.84	3.2	14.33	62.39	3.2	24.43	63.10	3.3	44.06	23.25	3.3	10.40	40.56
4.1	26.52	20.66	4.2	13.80	62.19	4.2	24.26	63.02	4.2	43.87	23.25	4.3	10.30	40.61
5.1	26.40	20.49	5.2	13.28	61.97	5.2	24.08	62.93	5.2	43.69	23.22	5.3	10.19	40.67
6.1	26.27	20.34	6.2	12.80	61.75	6.2	23.90	62.85	6.2	43.51	23.18	6.3	10.07	40.74
7.1	26.12	20.17	7.2	12.33	61.52	7.2	23.71	62.77	7.2	43.34	23.12	7.3	9.94	40.81
8.1	25.98	20.00	8.2	11.89	61.29	8.2	23.52	62.68	8.2	43.16	23.05	8.3	9.82	40.87
9.1	25.82	19.82	9.2	11.46	61.06	9.2	23.32	62.59	9.2	42.98	22.99	9.3	9.69	40.93
10.1	25.67	19.62	10.2	11.03	60.84	10.2	23.10	62.47	10.2	42.81	22.92	10.2	9.56	40.98
11.1	25.52	19.39	11.2	10.60	60.64	11.2	22.89	62.34	11.2	42.65	22.87	11.2	9.41	41.00
12.1	25.38	19.14	12.2	10.15	60.44	12.2	22.69	62.17	12.2	42.48	22.83	12.2	9.28	41.00
13.1	25.26	18.89	13.2	9.69	60.24	13.2	22.50	62.00	13.2	42.31	22.80	13.2	9.14	40.96
14.1	25.15	18.64	14.1	9.21	60.04	14.2	22.33	61.81	14.2	42.13	22.78	14.2	9.00	40.92
15.1	25.05	18.39	15.1	8.70	59.82	15.2	22.18	61.63	15.2	41.94	22.74	15.2	8.90	40.89
16.1	24.96	18.16	16.1	8.19	59.58	16.2	22.03	61.47	16.2	41.75	22.70	16.2	8.79	40.85
17.1	24.86	17.94	17.1	7.71	59.32	17.2	21.89	61.32	17.2	41.57	22.62	17.2	8.68	40.83
18.1	24.76	17.74	18.1	7.23	59.05	18.2	21.74	61.19	18.2	41.38	22.53	18.2	8.58	40.82
19.1	24.66	17.54	19.1	6.80	58.77	19.1	21.57	61.05	19.2	41.20	22.42	19.2	8.45	40.81
20.1	24.54	17.31	20.1	6.38	58.49	20.1	21.40	60.91	20.2	41.02	22.29	20.2	8.33	40.81
21.1	24.43	17.08	21.1	6.01	58.20	21.1	21.22	60.75	21.2	40.85	22.16	21.2	8.20	40.80
22.1	24.30	16.82	22.1	5.63	57.93	22.1	21.04	60.57	22.2	40.68	22.03	22.2	8.07	40.77
23.1	24.18	16.55	23.1	5.26	57.67	23.1	20.86	60.38	23.2	40.52	21.92	23.2	7.93	40.74
24.1	24.07	16.27	24.1	4.89	57.41	24.1	20.67	60.16	24.2	40.35	21.81	24.2	7.79	40.69
25.1	23.97	15.99	25.1	4.50	57.16	25.1	20.49	59.94	25.2	40.20	21.71	25.2	7.64	40.61
26.1	23.87	15.69	26.1	4.12	56.91	26.1	20.32	59.72	26.2	40.03	21.61	26.2	7.51	40.52
27.1	23.78	15.39	27.1	3.72	56.66	27.1	20.17	59.48	27.2	39.86	21.50	27.2	7.37	40.42
28.1	23.69	15.10	28.1	3.31	56.39	28.1	20.02	59.24	28.2	39.69	21.40	28.2	7.24	40.32
29.1	23.63	14.80	29.1	2.91	56.12	29.1	19.88	58.99	29.2	39.52	21.29	29.2	7.12	40.21
30.1	23.57	14.51	30.1	2.50	55.85	30.1	19.75	58.75	30.2	39.35	21.16	30.2	7.01	40.09
31.1	23.51	14.23	31.1	2.09	55.56	31.1	19.63	58.52	31.2	39.18	21.02	31.2	6.90	39.99
32.1	23.45	13.96	32.1	1.70	55.24	32.1	19.51	58.30	32.2	39.00	20.87	32.2	6.79	39.89
8.60 -8.54			23.23 +23.21			9.92 -9.87			7.34 +7.27			6.25 -6.17		
14 ^h 14 ^m 23 ^s .592			15 ^h 1 ^m 45 ^s .970			15 ^h 25 ^m 17 ^s .036			16 ^h 53 ^m 48 ^s .037			17 ^h 17 ^m 1 ^s .936		
-83° 19' 1''.42			+87° 31' 46''.68			-84° 12' 45''.34			+82° 9' 58''.64			-80° 47' 29''.50		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Sept.	17 56	+86 37	Sept.	18 10	-87 39	Sept.	18 54	+89 1	Sept.	19 38	-89 12	Sept.	20 48	+82 15
	s	"		s	"		s	"		s	"		s	"
1.3	61.36	16.72	1.3	19.31	56.37	1.3	94.67	59.05	1.4	44.82	41.75	1.4	24.30	13.47
2.3	60.95	16.85	2.3	18.86	56.48	2.3	93.41	59.25	2.4	43.78	41.96	2.4	24.22	13.81
3.3	60.54	16.95	3.3	18.43	56.61	3.3	92.10	59.45	3.4	42.79	42.16	3.4	24.12	14.14
4.3	60.12	17.05	4.3	18.00	56.73	4.3	90.73	59.63	4.4	41.84	42.37	4.4	24.02	14.49
5.3	59.68	17.12	5.3	17.58	56.86	5.3	89.32	59.80	5.4	40.90	42.59	5.4	23.91	14.82
6.3	59.25	17.18	6.3	17.16	57.00	6.3	87.89	59.95	6.4	39.97	42.81	6.4	23.80	15.13
7.3	58.82	17.23	7.3	16.71	57.13	7.3	86.47	60.09	7.4	39.01	43.05	7.4	23.68	15.42
8.3	58.40	17.27	8.3	16.25	57.27	8.3	85.07	60.22	8.4	37.98	43.29	8.4	23.57	15.70
9.3	58.00	17.30	9.3	15.77	57.40	9.3	83.71	60.34	9.3	36.86	43.53	9.4	23.45	15.97
10.3	57.62	17.33	10.3	15.25	57.52	10.3	82.40	60.46	10.3	35.64	43.76	10.4	23.34	16.23
11.3	57.22	17.37	11.3	14.71	57.62	11.3	81.14	60 59	11.3	34.34	43.97	11.4	23.23	16.49
12.3	56.83	17.42	12.3	14.15	57.71	12.3	79.89	60.73	12.3	32.98	44.16	12.4	23.13	16.77
13.3	56.42	17.49	13.3	13.62	57.76	13.3	78.60	60.90	13.3	31.61	44.33	13.4	23.02	17.06
14.3	56.01	17.57	14.3	13.11	57.81	14.3	77.25	61.07	14.3	30.28	44.48	14.4	22.91	17.38
15.3	55.58	17.65	15.3	12.64	57.84	15.3	75.83	61.23	15.3	29.01	44.63	15.4	22.80	17.70
16.3	55.13	17.71	16.3	12.18	57.87	16.3	74.35	61.38	16.3	27.82	44.78	16.4	22.67	18.02
17.3	54.68	17.76	17.3	11.74	57.91	17.3	72.82	61.52	17.3	26.67	44.92	17.4	22.54	18.32
18.3	54.23	17.77	18.3	11.31	57.96	18.3	71.26	61.63	18.3	25.53	45.09	18.4	22.41	18.61
19.3	53.77	17.76	19.3	10.85	58.02	19.3	69.70	61.73	19.3	24.38	45.26	19.4	22.27	18.87
20.2	53.34	17.73	20.3	10.36	58.09	20.3	68.18	61.82	20.3	23.16	45.43	20.4	22.13	19.11
21.2	52.90	17.69	21.3	9.85	58.15	21.3	66.72	61.88	21.3	21.87	45.61	21.4	21.99	19.35
22.2	52.49	17.66	22.3	9.31	58.21	22.3	65.30	61.94	22.3	20.47	45.78	22.4	21.85	19.58
23.2	52.11	17.65	23.3	8.75	58.26	23.3	63.93	62.00	23.3	18.99	45.94	23.4	21.71	19.80
24.2	51.71	17.63	24.2	8.18	58.28	24.3	62.58	62.09	24.3	17.47	46.09	24.4	21.58	20.02
25.2	51.32	17.62	25.2	7.60	58.29	25.3	61.24	62.17	25.3	15.90	46.22	25.4	21.45	20.25
26.2	50.91	17.61	26.2	7.03	58.28	26.3	59.88	62.26	26.3	14.33	46.33	26.4	21.32	20.49
27.2	50.51	17.61	27.2	6.47	58.27	27.3	58.50	62.35	27.3	12.77	46.41	27.4	21.20	20.73
28.2	50.09	17.61	28.2	5.94	58.23	28.3	57.08	62.44	28.3	11.22	46.53	28.3	21.07	20.97
29.2	49.67	17.61	29.2	5.42	58.20	29.3	55.63	62.53	29.3	9.70	46.62	29.3	20.94	21.22
30.2	49.23	17.60	30.2	4.91	58.15	30.3	54.14	62.61	30.3	8.23	46.69	30.3	20.79	21.48
31.2	48.80	17.57	31.2	4.44	58.09	31.3	52.60	62.67	31.3	6.81	46.77	31.3	20.64	21.72
32.2	48.34	17.52	32.2	3.96	58.04	32.3	51.02	62.73	32.3	5.44	46.85	32.3	20.49	21.96
16.97	+16.94		24.56	-24.54		59.29	+59.28		72.75	-72.74		7.42	+7.35	
17 ^h 57 ^m	4 ^s .326		18 ^h 9 ^m	46 ^s .186		18 ^h 55 ^m	23 ^s .393		19 ^h 37 ^m	1 ^s .735		20 ^h 48 ^m	15 ^s .385	
+86° 36'	50'' .43		-87° 39'	48'' .39		+89° 1'	32'' .83		-89° 12'	41'' .41		+82° 14'	50'' .67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
h m	° '		h m	° '		h m	° '		h m	° '		h m	° '	
Sept. 21 39	-83 4		Sept. 22 17	-86 21		Sept. 22 38	-81 46		Sept. 23 28	+86 53		Sept. 23 47	-82 26	
	s			s			s			s			s	
1.5	28.29	17.81	1.5	40.82	24.88	1.5	25.54	54.16	1.5	14.96	6.05	1.5	44.89	29.21
2.5	28.25	18.10	2.5	40.79	25.17	2.5	25.54	54.45	2.5	15.05	6.43	2.5	44.94	29.49
3.5	28.22	18.38	3.5	40.78	25.45	3.5	25.55	54.73	3.5	15.12	6.82	3.5	45.00	29.76
4.4	28.19	18.65	4.5	40.77	25.73	4.5	25.56	55.01	4.5	15.18	7.21	4.5	45.06	30.03
5.4	28.16	18.93	5.5	40.77	26.02	5.5	25.58	55.29	5.5	15.23	7.61	5.5	45.12	30.29
6.4	28.15	19.21	6.5	40.77	26.31	6.5	25.60	55.58	6.5	15.24	8.00	6.5	45.18	30.55
7.4	28.14	19.50	7.5	40.78	26.62	7.5	25.62	55.88	7.5	15.25	8.40	7.5	45.24	30.82
8.4	28.10	19.82	8.5	40.78	26.94	8.5	25.64	56.19	8.5	15.24	8.78	8.5	45.31	31.11
9.4	28.06	20.14	9.5	40.75	27.27	9.5	25.64	56.52	9.5	15.22	9.15	9.5	45.37	31.43
10.4	28.01	20.46	10.5	40.70	27.61	10.5	25.63	56.85	10.5	15.21	9.48	10.5	45.42	31.75
11.4	27.93	20.78	11.5	40.62	27.94	11.5	25.62	57.19	11.5	15.21	9.83	11.5	45.46	32.08
12.4	27.85	21.08	12.5	40.53	28.27	12.5	25.59	57.51	12.5	15.22	10.18	12.5	45.47	32.41
13.4	27.77	21.36	13.5	40.43	28.58	13.5	25.55	57.82	13.5	15.26	10.55	13.5	45.48	32.74
14.4	27.68	21.61	14.4	40.31	28.87	14.5	25.51	58.12	14.5	15.29	10.92	14.5	45.49	33.05
15.4	27.60	21.86	15.4	40.20	29.15	15.5	25.48	58.41	15.5	15.33	11.33	15.5	45.49	33.34
16.4	27.54	22.10	16.4	40.10	29.41	16.5	25.46	58.67	16.5	15.34	11.73	16.5	45.50	33.62
17.4	27.47	22.35	17.4	40.01	29.67	17.5	25.43	58.93	17.5	15.33	12.15	17.5	45.52	33.89
18.4	27.41	22.60	18.4	39.93	29.94	18.5	25.42	59.20	18.5	15.28	12.56	18.5	45.55	34.17
19.4	27.35	22.87	19.4	39.86	30.21	19.4	25.41	59.49	19.5	15.23	12.95	19.5	45.58	34.46
20.4	27.29	23.15	20.4	39.78	30.52	20.4	25.38	59.80	20.5	15.14	13.34	20.5	45.61	34.77
21.4	27.21	23.44	21.4	39.69	30.83	21.4	25.35	60.11	21.5	15.05	13.71	21.5	45.63	35.08
22.4	27.13	23.73	22.4	39.57	31.14	22.4	25.32	60.44	22.5	14.97	14.07	22.5	45.64	35.41
23.4	27.03	24.02	23.4	39.44	31.46	23.4	25.27	60.76	23.5	14.89	14.43	23.5	45.64	35.75
24.4	26.92	24.31	24.4	39.29	31.78	24.4	25.21	61.08	24.5	14.81	14.77	24.5	45.64	36.10
25.4	26.79	24.59	25.4	39.11	32.08	25.4	25.15	61.40	25.5	14.75	15.11	25.5	45.62	36.44
26.4	26.67	24.84	26.4	38.93	32.37	26.4	25.09	61.71	26.5	14.69	15.48	26.5	45.59	36.78
27.4	26.55	25.09	27.4	38.74	32.66	27.4	25.02	62.01	27.5	14.64	15.83	27.5	45.56	37.12
28.4	26.43	25.34	28.4	38.55	32.94	28.4	24.95	62.29	28.5	14.58	16.19	28.5	45.52	37.44
29.4	26.31	25.56	29.4	38.35	33.19	29.4	24.88	62.57	29.5	14.51	16.56	29.5	45.49	37.75
30.4	26.19	25.77	30.4	38.16	33.44	30.4	24.81	62.83	30.5	14.43	16.95	30.5	45.46	38.05
31.4	26.08	25.97	31.4	37.98	33.69	31.4	24.75	63.09	31.4	14.34	17.34	31.5	45.43	38.34
32.4	25.98	26.19	32.4	37.80	33.93	32.4	24.68	63.34	32.4	14.24	17.73	32.5	45.40	38.63
8.29	-8.23		15.74	-15.71		7.00	-6.92		18.41	+18.38		7.60	-7.54	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28".91			-86° 21' 38".42			-81° 47' 9".68			+86° 52' 58".09			-82° 26' 48".40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Oct.	0 58	+85 50	Oct.	1 34	+88 53	Oct.	1 41	-85 9	Oct.	4 12	+85 20	Oct.	5 37	+85 9
	s	"		s	"		s	"		s	"		s	"
0.5	24.77	49.96	0.5	59.38	37.35	0.5	46.01	18.69	0.6	11.37	49.25	0.7	21.16	18.19
1.5	24.85	50.34	1.5	59.86	37.72	1.5	46.08	18.98	1.6	11.66	49.45	1.7	21.48	18.27
2.5	24.91	50.74	2.5	60.29	38.10	2.5	46.15	19.26	2.6	11.95	49.68	2.7	21.80	18.35
3.5	24.96	51.15	3.5	60.65	38.51	3.5	46.22	19.54	3.6	12.23	49.91	3.7	22.12	18.45
4.5	24.99	51.56	4.5	60.96	38.90	4.5	46.32	19.82	4.6	12.50	50.16	4.7	22.44	18.58
5.5	25.00	51.95	5.5	61.20	39.29	5.5	46.40	20.10	5.6	12.75	50.42	5.7	22.73	18.71
6.5	25.00	52.34	6.5	61.39	39.67	6.5	46.49	20.41	6.6	12.99	50.67	6.7	23.02	18.84
7.5	25.00	52.70	7.5	61.59	40.04	7.5	46.55	20.74	7.6	13.21	50.92	7.7	23.29	18.97
8.5	25.00	53.06	8.5	61.81	40.38	8.5	46.62	21.08	8.6	13.43	51.15	8.7	23.55	19.08
9.5	25.01	53.40	9.5	62.07	40.73	9.5	46.67	21.42	9.6	13.66	51.37	9.7	23.82	19.18
10.5	25.05	53.75	10.5	62.38	41.07	10.5	46.70	21.77	10.6	13.90	51.57	10.7	24.09	19.27
11.5	25.10	54.11	11.5	62.74	41.44	11.5	46.71	22.11	11.6	14.15	51.79	11.7	24.38	19.35
12.5	25.15	54.49	12.5	63.11	41.81	12.5	46.70	22.44	12.6	14.42	52.01	12.7	24.69	19.44
13.5	25.19	54.89	13.5	63.45	42.20	13.5	46.70	22.75	13.6	14.69	52.24	13.7	25.01	19.55
14.5	25.21	55.30	14.5	63.74	42.60	14.5	46.70	23.04	14.6	14.97	52.49	14.7	25.34	19.67
15.5	25.22	55.71	15.5	63.96	43.02	15.5	46.70	23.32	15.6	15.24	52.77	15.7	25.65	19.81
16.5	25.21	56.12	16.5	64.11	43.43	16.5	46.71	23.60	16.6	15.48	53.06	16.7	25.95	19.98
17.5	25.17	56.53	17.5	64.17	43.84	17.5	46.73	23.91	17.6	15.72	53.35	17.7	26.24	20.15
18.5	25.12	56.90	18.5	64.19	44.22	18.5	46.75	24.23	18.6	15.93	53.64	18.7	26.52	20.34
19.5	25.07	57.27	19.5	64.18	44.60	19.5	46.77	24.55	19.6	16.12	53.94	19.7	26.79	20.52
20.5	25.01	57.61	20.5	64.16	44.96	20.5	46.78	24.89	20.6	16.31	54.22	20.7	27.03	20.70
21.5	24.96	57.95	21.5	64.16	45.32	21.5	46.78	25.23	21.6	16.49	54.48	21.7	27.27	20.86
22.5	24.91	58.29	22.5	64.19	45.66	22.5	46.76	25.59	22.6	16.67	54.74	22.6	27.51	21.02
23.5	24.87	58.63	23.5	64.22	46.00	23.5	46.73	25.95	23.6	16.86	55.00	23.6	27.76	21.17
24.5	24.83	58.97	24.5	64.26	46.35	24.5	46.69	26.29	24.6	17.05	55.26	24.6	28.01	21.32
25.4	24.80	59.33	25.5	64.32	46.70	25.5	46.65	26.63	25.6	17.25	55.52	25.6	28.26	21.47
26.4	24.77	59.69	26.5	64.38	47.06	26.5	46.59	26.96	26.6	17.46	55.78	26.6	28.53	21.64
27.4	24.74	60.05	27.5	64.43	47.44	27.5	46.52	27.29	27.6	17.66	56.05	27.6	28.80	21.81
28.4	24.69	60.42	28.5	64.45	47.83	28.5	46.45	27.60	28.6	17.88	56.33	28.6	29.08	22.00
29.4	24.63	60.80	29.5	64.43	48.22	29.5	46.39	27.89	29.6	18.09	56.65	29.6	29.35	22.20
30.4	24.56	61.18	30.5	64.35	48.61	30.5	46.33	28.19	30.6	18.29	56.97	30.6	29.63	22.41
31.4	24.47	61.57	31.5	64.21	49.02	31.5	46.28	28.47	31.6	18.48	57.31	31.6	29.90	22.64
13.81	+13.78		51.87	+51.86		11.84	-11.80		12.33	+12.29		11.84	+11.80	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Oct.	5 44	-84 49	Oct.	6 46	-80 43	Oct.	7 5	+87 9	Oct.	7 14	-86 54	Oct.	7 15	+82 33
	s	"		s	"		s	"		s	"		s	"
0.7	59.92	27.12	0.8	25.98	52.69	0.8	9.54	52.05	0.8	4.56	38.33	0.8	3.77	22 43
1.7	60.15	27.18	1.8	26.11	52.68	1.8	10.08	51.97	1.8	4.93	38.29	1.8	3.98	22.34
2.7	60.37	27.25	2.7	26.24	52.68	2.8	10.64	51.90	2.8	5.30	38.25	2.8	4.18	22.25
3.7	60.59	27.32	3.7	26.37	52.66	3.8	11.20	51.84	3.8	5.67	38.21	3.8	4.41	22.19
4.7	60.81	27.37	4.7	26.49	52.64	4.8	11.75	51.80	4.8	6.04	38.15	4.8	4.63	22.14
5.7	61.04	27.42	5.7	26.63	52.62	5.8	12.28	51.79	5.8	6.42	38.09	5.8	4.83	22.10
6.7	61.27	27.48	6.7	26.77	52.60	6.8	12.79	51.78	6.8	6.82	38.02	6.8	5.03	22.06
7.7	61.51	27.57	7.7	26.91	52.59	7.7	13.28	51.77	7.8	7.23	37.97	7.8	5.22	22.03
8.7	61.75	27.67	8.7	27.05	52.60	8.7	13.76	51.73	8.8	7.66	37.95	8.8	5.40	21.99
9.7	62.00	27.79	9.7	27.20	52.64	9.7	14.24	51.71	9.7	8.09	37.94	9.8	5.58	21.94
10.7	62.24	27.93	10.7	27.35	52.71	10.7	14.72	51.67	10.7	8.51	37.97	10.7	5.77	21.88
11.7	62.46	28.11	11.7	27.48	52.80	11.7	15.23	51.62	11.7	8.93	38.00	11.7	5.96	21.81
12.7	62.66	28.29	12.7	27.62	52.90	12.7	15.75	51.57	12.7	9.32	38.05	12.7	6.16	21.74
13.7	62.86	28.45	13.7	27.75	52.99	13.7	16.30	51.52	13.7	9.71	38.11	13.7	6.38	21.67
14.7	63.06	28.61	14.7	27.87	53.07	14.7	16.87	51.50	14.7	10.08	38.16	14.7	6.60	21.62
15.7	63.26	28.76	15.7	28.00	53.15	15.7	17.45	51.49	15.7	10.44	38.20	15.7	6.83	21.60
16.7	63.45	28.90	16.7	28.12	53.21	16.7	18.03	51.50	16.7	10.80	38.22	16.7	7.05	21.59
17.7	63.65	29.03	17.7	28.26	53.27	17.7	18.58	51.54	17.7	11.17	38.25	17.7	7.25	21.59
18.7	63.87	29.16	18.7	28.39	53.33	18.7	19.10	51.58	18.7	11.56	38.26	18.7	7.46	21.62
19.7	64.09	29.30	19.7	28.52	53.41	19.7	19.60	51.63	19.7	11.96	38.29	19.7	7.66	21.66
20.7	64.32	29.48	20.7	28.65	53.49	20.7	20.08	51.67	20.7	12.38	38.32	20.7	7.85	21.69
21.7	64.54	29.65	21.7	28.79	53.59	21.7	20.54	51.72	21.7	12.80	38.37	21.7	8.04	21.70
22.7	64.74	29.84	22.7	28.94	53.72	22.7	21.01	51.76	22.7	13.22	38.46	22.7	8.22	21.72
23.6	64.95	30.06	23.7	29.08	53.85	23.7	21.48	51.80	23.7	13.65	38.54	23.7	8.40	21.73
24.6	65.16	30.28	24.7	29.22	53.99	24.7	21.95	51.82	24.7	14.07	38.64	24.7	8.58	21.74
25.6	65.36	30.51	25.7	29.35	54.16	25.7	22.43	51.85	25.7	14.47	38.77	25.7	8.77	21.74
26.6	65.55	30.75	26.7	29.47	54.33	26.7	22.94	51.88	26.7	14.86	38.90	26.7	8.96	21.74
27.6	65.72	30.99	27.7	29.60	54.50	27.7	23.45	51.92	27.7	15.24	39.03	27.7	9.15	21.75
28.6	65.89	31.23	28.7	29.73	54.68	28.7	23.98	51.96	28.7	15.61	39.16	28.7	9.36	21.78
29.6	66.06	31.47	29.7	29.83	54.85	29.7	24.51	52.01	29.7	15.97	39.29	29.7	9.58	21.82
30.6	66.21	31.70	30.7	29.94	55.00	30.7	25.04	52.09	30.7	16.31	39.42	30.7	9.80	21.87
31.6	66.38	31.90	31.7	30.05	55.15	31.7	25.58	52.18	31.7	16.65	39.54	31.7	10.00	21.94
11.09	-11.04		6.21	-6.13		20.21	+20.19		18.55	-18.53		7.72	+7.65	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 54'9		7 ^h 14 ^m	18° 18'5		7 ^h 14 ^m	59° 08'3	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m 8 21	° ' +88 51	Oct.	h m 9 7	° ' -85 21	Oct.	h m 9 26	° ' +81 39	Oct.	h m 9 36	° ' -80 35	Oct.	h m 10 21	° ' +82 56
	s	"		s	"		s	"		s	"		s	"
0.8	32.51	21.55	0.9	58.80	24.75	0.9	10.78	40.16	0.9	8.47	44.72	0.9	42.05	41.09
1.8	33.67	21.35	1.8	59.01	24.58	1.9	10.91	39.86	1.9	8.56	44.53	1.9	42.16	40.74
2.8	34.88	21.16	2.8	59.21	24.40	2.9	11.05	39.57	2.9	8.66	44.33	2.9	42.29	40.39
3.8	36.12	20.98	3.8	59.40	24.21	3.9	11.20	39.29	3.9	8.76	44.13	3.9	42.43	40.05
4.8	37.37	20.83	4.8	59.59	24.02	4.9	11.35	39.05	4.9	8.85	43.90	4.9	42.57	39.73
5.8	38.59	20.69	5.8	59.79	23.82	5.9	11.50	38.81	5.9	8.93	43.68	5.9	42.71	39.42
6.8	39.77	20.55	6.8	59.99	23.63	6.9	11.65	38.57	6.9	9.02	43.46	6.9	42.84	39.13
7.8	40.91	20.42	7.8	60.22	23.43	7.8	11.78	38.35	7.9	9.13	43.23	7.9	42.96	38.84
8.8	42.01	20.28	8.8	60.46	23.24	8.8	11.91	38.13	8.8	9.24	43.03	8.9	43.09	38.56
9.8	43.08	20.14	9.8	60.73	23.06	9.8	12.04	37.91	9.8	9.35	42.83	9.9	43.20	38.27
10.8	44.15	19.97	10.8	60.99	22.92	10.8	12.16	37.67	10.8	9.48	42.65	10.9	43.31	37.96
11.8	45.27	19.80	11.8	61.25	22.81	11.8	12.29	37.40	11.8	9.60	42.50	11.9	43.42	37.65
12.8	46.45	19.62	12.8	61.50	22.71	12.8	12.42	37.13	12.8	9.72	42.36	12.9	43.54	37.32
13.8	47.69	19.45	13.8	61.75	22.62	13.8	12.58	36.86	13.8	9.85	42.24	13.9	43.68	36.99
14.8	48.98	19.30	14.8	61.98	22.53	14.8	12.74	36.59	14.8	9.97	42.12	14.9	43.83	36.66
15.8	50.32	19.17	15.8	62.21	22.44	15.8	12.91	36.35	15.8	10.08	42.00	15.9	44.00	36.34
16.8	51.64	19.06	16.8	62.44	22.32	16.8	13.08	36.12	16.8	10.19	41.87	16.9	44.16	36.04
17.8	52.96	18.96	17.8	62.66	22.20	17.8	13.25	35.91	17.8	10.30	41.73	17.9	44.32	35.75
18.8	54.23	18.87	18.8	62.89	22.07	18.8	13.41	35.72	18.8	10.41	41.58	18.9	44.48	35.49
19.8	55.45	18.79	19.8	63.14	21.94	19.8	13.56	35.54	19.8	10.53	41.42	19.9	44.64	35.24
20.8	56.63	18.72	20.8	63.40	21.82	20.8	13.70	35.38	20.8	10.65	41.27	20.9	44.79	35.00
21.8	57.78	18.64	21.8	63.67	21.71	21.8	13.85	35.21	21.8	10.78	41.12	21.8	44.93	34.77
22.8	58.90	18.56	22.8	63.95	21.61	22.8	14.00	35.02	22.8	10.91	40.99	22.8	45.08	34.53
23.8	60.03	18.49	23.8	64.23	21.53	23.8	14.14	34.84	23.8	11.05	40.89	23.8	45.22	34.29
24.8	61.18	18.40	24.8	64.52	21.47	24.8	14.28	34.65	24.8	11.19	40.78	24.8	45.36	34.02
25.7	62.34	18.31	25.8	64.80	21.42	25.8	14.43	34.47	25.8	11.33	40.71	25.8	45.50	33.76
26.7	63.53	18.22	26.8	65.08	21.38	26.8	14.58	34.28	26.8	11.47	40.65	26.8	45.65	33.50
27.7	64.77	18.13	27.8	65.35	21.37	27.8	14.74	34.09	27.8	11.60	40.59	27.8	45.80	33.23
28.7	66.05	18.05	28.8	65.61	21.36	28.8	14.91	33.89	28.8	11.73	40.54	28.8	45.98	32.96
29.7	67.36	17.99	29.8	65.88	21.34	29.8	15.08	33.71	29.8	11.86	40.49	29.8	46.16	32.71
30.7	68.71	17.94	30.8	66.14	21.32	30.8	15.26	33.54	30.8	11.99	40.44	30.8	46.34	32.46
31.7	70.06	17.90	31.8	66.38	21.30	31.8	15.45	33.38	31.8	12.12	40.39	31.8	46.53	32.22
50.06	+50.05		12.35	-12.31		6.89	+6.82		6.12	-6.04		8.14	+8.08	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	10 59	-84 10		12 13	+88 7		12 46	-84 42		12 48	+83 49		13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
0.9	46.62	52.68	0.9	36.14	23.37	1.0	39.12	30.85	1.0	16.77	44.79	1.0	6.45	46.13
1.9	46.71	52.42	1.9	36.17	22.97	2.0	39.12	30.55	2.0	16.76	44.39	2.0	6.41	45.85
2.9	46.80	52.16	2.9	36.24	22.57	3.0	39.13	30.26	3.0	16.75	43.98	3.0	6.37	45.57
3.9	46.88	51.90	3.9	36.34	22.17	3.9	39.12	29.96	3.9	16.75	43.58	4.0	6.32	45.30
4.9	46.96	51.62	4.9	36.48	21.78	4.9	39.10	29.66	4.9	16.76	43.18	5.0	6.25	45.02
5.9	47.04	51.34	5.9	36.64	21.39	5.9	39.09	29.35	5.9	16.77	42.78	6.0	6.19	44.71
6.9	47.13	51.05	6.9	36.80	21.02	6.9	39.08	29.03	6.9	16.78	42.40	7.0	6.13	44.39
7.9	47.22	50.75	7.9	36.95	20.66	7.9	39.08	28.70	7.9	16.79	42.04	8.0	6.07	44.07
8.9	47.34	50.45	8.9	37.06	20.31	8.9	39.08	28.35	8.9	16.80	41.68	9.0	6.03	43.74
9.9	47.47	50.16	9.9	37.17	19.95	9.9	39.12	28.00	9.9	16.80	41.34	10.0	6.02	43.40
10.9	47.61	49.89	10.9	37.24	19.59	10.9	39.16	27.67	10.9	16.79	40.98	11.0	6.02	43.05
11.9	47.75	49.65	11.9	37.30	19.22	11.9	39.23	27.37	11.9	16.78	40.61	12.0	6.05	42.73
12.9	47.90	49.42	12.9	37.38	18.83	12.9	39.31	27.08	12.9	16.78	40.21	13.0	6.09	42.41
13.9	48.05	49.20	13.9	37.49	18.42	13.9	39.39	26.80	13.9	16.78	39.80	13.9	6.14	42.13
14.9	48.20	49.00	14.9	37.65	18.02	14.9	39.45	26.53	14.9	16.79	39.38	14.9	6.17	41.84
15.9	48.33	48.80	15.9	37.86	17.61	15.9	39.51	26.26	15.9	16.83	38.95	15.9	6.18	41.56
16.9	48.46	48.57	16.9	38.10	17.22	16.9	39.56	25.98	16.9	16.87	38.53	16.9	6.20	41.29
17.9	48.58	48.34	17.9	38.38	16 83	17.9	39.60	25.70	17.9	16.92	38.14	17.9	6.20	41.00
18.9	48.70	48.10	18.9	38.67	16.46	18.9	39.65	25.38	18.9	16.97	37.76	18.9	6.20	40.68
19.9	48.83	47.84	19.9	38.95	16.13	19.9	39.69	25.07	19.9	17.03	37.40	19.9	6.20	40.37
20.9	48.98	47.59	20.9	39.22	15.79	20.9	39.75	24.74	20.9	17.08	37.04	20.9	6.21	40.04
21.9	49.14	47.35	21.9	39.46	15.46	21.9	39.83	24.41	21.9	17.12	36.70	21.9	6.25	39.70
22.9	49.31	47.11	22.9	39.69	15.13	22.9	39.91	24.09	22.9	17.17	36.35	22.9	6.29	39.36
23.9	49.48	46.88	23.9	39.91	14.79	23.9	40.00	23.77	23.9	17.21	36.00	23.9	6.36	39.02
24.9	49.65	46.68	24.9	40.13	14.45	24.9	40.10	23.47	24.9	17.24	35.64	24.9	6.44	38.69
25.9	49.84	46.48	25.9	40.36	14.10	25.9	40.23	23.18	25.9	17.28	35.28	25.9	6.52	38.37
26.9	50.03	46.29	26.9	40.60	13.74	26.9	40.35	22.89	26.9	17.33	34.91	26.9	6.61	38.06
27.9	50.21	46.14	27.9	40.86	13.38	27.9	40.48	22.61	27.9	17.38	34.54	27.9	6.71	37.77
28.9	50.40	45.98	28.9	41.14	13.01	28.9	40.61	22.36	28.9	17.44	34.15	28.9	6.81	37.48
29.9	50.58	45.83	29.9	41.47	12.65	29.9	40.74	22.12	29.9	17.51	33.76	29.9	6.92	37.21
30.8	50.76	45.68	30.9	41.83	12.29	30.9	40.85	21.87	30.9	17.59	33.35	30.9	7.01	36.93
31.8	50.92	45.52	31.9	42.23	11.93	31.9	40.96	21.62	31.9	17.69	32.96	31.9	7.10	36.65
9.86	-9.81		30.51	+30.49		10.84	-10.79		9.30	+9.25		12.46	-12.12	
10 ^h 59 ^m	53°.036		12 ^h 14 ^m	30°.802		12 ^h 46 ^m	43°.161		12 ^h 48 ^m	33°.111		13 ^h 28 ^m	9°.628	
-84° 10'	46''.79		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	14 14	-83 19		15 0	+87 31		15 25	-84 12		16 53	+82 10		17 17	-80 47
	s	"		s	"		s	"		s	"		s	"
1.1	23.51	14.23	1.1	62.09	55.56	1.1	19.63	58.52	1.2	39.18	21.02	1.2	6.90	39.99
2.1	23.45	13.96	2.1	61.70	55.24	2.1	19.51	58.30	2.2	39.00	20.87	2.2	6.79	39.89
3.1	23.39	13.70	3.1	61.32	54.91	3.1	19.39	58.10	3.2	38.83	20.70	3.2	6.69	39.79
4.1	23.33	13.44	4.1	60.98	54.58	4.1	19.27	57.89	4.2	38.66	20.52	4.2	6.58	39.71
5.1	23.25	13.18	5.1	60.65	54.24	5.1	19.13	57.67	5.2	38.50	20.33	5.2	6.45	39.62
6.1	23.17	12.91	6.1	60.35	53.91	6.1	18.99	57.44	6.2	38.34	20.12	6.2	6.33	39.53
7.1	23.09	12.62	7.1	60.06	53.59	7.1	18.85	57.21	7.2	38.19	19.92	7.2	6.21	39.44
8.0	23.03	12.30	8.1	59.78	53.28	8.1	18.70	56.97	8.2	38.04	19.73	8.2	6.09	39.31
9.0	22.96	11.98	9.1	59.48	52.99	9.1	18.56	56.69	9.2	37.89	19.56	9.2	5.95	39.17
10.0	22.90	11.65	10.1	59.16	52.70	10.1	18.45	56.40	10.2	37.74	19.39	10.2	5.84	39.00
11.0	22.87	11.32	11.1	58.83	52.41	11.1	18.34	56.10	11.1	37.59	19.24	11.2	5.73	38.82
12.0	22.86	11.00	12.1	58.49	52.10	12.1	18.25	55.80	12.1	37.42	19.07	12.2	5.62	38.63
13.0	22.85	10.70	13.1	58.12	51.78	13.1	18.18	55.52	13.1	37.25	18.90	13.2	5.52	38.44
14.0	22.85	10.41	14.1	57.78	51.44	14.1	18.12	55.25	14.1	37.07	18.70	14.2	5.43	38.26
15.0	22.84	10.13	15.1	57.45	51.07	15.1	18.06	55.01	15.1	36.92	18.48	15.2	5.34	38.09
16.0	22.82	9.87	16.1	57.16	50.70	16.1	17.98	54.76	16.1	36.76	18.25	16.2	5.26	37.94
17.0	22.79	9.59	17.1	56.91	50.33	17.1	17.90	54.51	17.1	36.61	18.00	17.1	5.17	37.79
18.0	22.76	9.30	18.1	56.67	49.96	18.1	17.80	54.25	18.1	36.46	17.75	18.1	5.07	37.65
19.0	22.73	8.99	19.1	56.48	49.59	19.1	17.70	53.98	19.1	36.32	17.48	19.1	4.97	37.48
20.0	22.70	8.68	20.0	56.28	49.26	20.1	17.61	53.70	20.1	36.19	17.23	20.1	4.86	37.31
21.0	22.67	8.36	21.0	56.08	48.92	21.1	17.51	53.41	21.1	36.07	16.99	21.1	4.74	37.13
22.0	22.66	8.03	22.0	55.88	48.59	22.1	17.42	53.09	22.1	35.94	16.75	22.1	4.63	36.93
23.0	22.65	7.69	23.0	55.67	48.26	23.1	17.33	52.77	23.1	35.81	16.53	23.1	4.52	36.70
24.0	22.65	7.35	24.0	55.47	47.94	24.1	17.27	52.45	24.1	35.67	16.30	24.1	4.42	36.47
25.0	22.66	7.01	25.0	55.24	47.61	25.1	17.22	52.12	25.1	35.54	16.08	25.1	4.32	36.24
25.9	22.68	6.68	26.0	55.02	47.28	26.0	17.18	51.79	26.1	35.41	15.85	26.1	4.23	35.99
26.9	22.71	6.35	27.0	54.80	46.94	27.0	17.14	51.47	27.1	35.28	15.61	27.1	4.15	35.75
27.9	22.75	6.04	28.0	54.58	46.58	28.0	17.11	51.16	28.1	35.14	15.36	28.1	4.09	35.51
28.9	22.79	5.75	29.0	54.38	46.22	29.0	17.10	50.87	29.1	35.00	15.10	29.1	4.02	35.27
29.9	22.83	5.47	30.0	54.18	45.84	30.0	17.08	50.59	30.1	34.86	14.82	30.1	3.95	35.04
30.9	22.86	5.18	31.0	54.02	45.45	31.0	17.06	50.31	31.1	34.74	14.50	31.1	3.89	34.82
31.9	22.89	4.91	32.0	53.88	45.06	32.0	17.03	50.03	32.1	34.62	14.19	32.1	3.83	34.62
8.60	-8.54		23.21	+23.19		9.92	-9.87		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m 23 ^s .592			15 ^h 1 ^m 45 ^s .970			15 ^h 25 ^m 17 ^s .036			16 ^h 53 ^m 48 ^s .037			17 ^h 17 ^m 1 ^s .936		
-83° 19'	1' 42"		+87° 31'	46' 68"		-84° 12'	45' 34"		+82° 9'	58' 64"		-80° 47'	29' 50"	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Oct.	17 56	+86 37	Oct.	18 9	-87 39	Oct.	18 54	+89 2	Oct.	19 37	-89 12	Oct.	20 48	+82 15
	s	"		s	"		s	"		s	"		s	"
1.2	48.80	17.57	1.2	64.44	58.09	1.3	52.60	2.67	1.3	66.81	46.77	1.3	20.64	21.72
2.2	48.34	17.52	2.2	63.96	58.04	2.3	51.02	2.73	2.3	65.44	46.85	2.3	20.49	21.96
3.2	47.90	17.46	3.2	63.50	58.00	3.3	49.42	2.76	3.3	64.09	46.93	3.3	20.31	22.17
4.2	47.46	17.37	4.2	63.03	57.95	4.3	47.82	2.77	4.3	62.75	47.01	4.3	20.16	22.38
5.2	47.02	17.28	5.2	62.54	57.92	5.3	46.23	2.78	5.3	61.34	47.10	5.3	19.99	22.56
6.2	46.60	17.17	6.2	62.03	57.89	6.2	44.71	2.78	6.3	59.87	47.19	6.3	19.84	22.73
7.2	46.20	17.07	7.2	61.49	57.87	7.2	43.24	2.77	7.3	58.34	47.28	7.3	19.68	22.90
8.2	45.81	16.97	8.2	60.94	57.83	8.2	41.82	2.76	8.3	56.72	47.34	8.3	19.53	23.06
9.2	45.43	16.89	9.2	60.38	57.78	9.2	40.43	2.76	9.3	55.05	47.40	9.3	19.37	23.23
10.2	45.02	16.82	10.2	59.84	57.69	10.2	39.04	2.79	10.3	53.37	47.42	10.3	19.22	23.41
11.2	44.62	16.76	11.2	59.32	57.60	11.2	37.61	2.83	11.3	51.72	47.43	11.3	19.08	23.61
12.2	44.21	16.70	12.2	58.84	57.47	12.2	36 12	2.87	12.3	50.14	47.42	12.3	18.93	23.81
13.2	43.78	16.62	13.2	58.38	57.33	13.2	34.55	2.88	13.3	48.65	47.40	13.3	18.78	24.02
14.2	43.34	16.53	14.2	57.99	57.20	14.2	32.94	2.90	14.3	47.24	47.39	14.3	18.61	24.21
15.2	42.90	16.43	15.2	57.55	57.07	15.2	31.30	2.90	15.3	45.87	47.39	15.3	18.43	24.40
16.2	42.45	16.29	16.2	57.13	56.94	16.2	29.66	2.87	16.2	44.49	47.39	16.3	18.26	24.55
17.2	42.03	16.15	17.2	56.70	56.84	17.2	28.06	2.82	17.2	43.10	47.41	17.3	18.07	24.70
18.2	41.62	15.98	18.2	56.24	56.73	18.2	26.53	2.76	18.2	41.63	47.42	18.3	17.90	24.83
19.2	41.24	15.81	19.2	55.75	56.63	19.2	25.05	2.69	19.2	40.10	47.43	19.3	17.72	24.93
20.2	40.86	15.65	20.2	55.24	56.52	20.2	23.63	2.61	20.2	38.48	47.44	20.3	17.55	25.03
21.2	40.50	15.50	21.2	54.73	56.40	21.2	22.26	2.54	21.2	36.81	47.44	21.3	17.38	25.13
22.2	40.14	15.35	22.2	54.21	56.27	22.2	20.90	2.48	22.2	35.13	47.40	22.3	17.23	25.23
23.2	39.78	15.21	23.2	53.72	56.10	23.2	19.54	2.42	23.2	33.44	47.36	23.3	17.07	25.34
24.2	39.42	15.07	24.2	53.24	55.93	24.2	18.16	2.38	24.2	31.76	47.30	24.3	16.91	25.47
25.2	39.05	14.93	25.2	52.77	55.74	25.2	16.77	2.33	25.2	30.13	47.24	25.3	16.75	25.58
26.2	38.67	14.79	26.2	52.33	55.54	26.2	15.36	2.29	26.2	28.54	47.15	26.3	16.59	25.69
27.1	38.30	14.65	27.2	51.90	55.31	27.2	13.92	2.23	27.2	27.02	47.05	27.3	16.42	25.81
28.1	37.92	14.48	28.2	51.51	55.11	28.2	12.43	2.15	28.2	25.54	46.96	28.3	16.25	25.92
29.1	37.53	14.31	29.2	51.13	54.92	29.2	10.92	2.08	29.2	24.12	46.86	29.3	16.07	26.03
30.1	37.14	14.13	30.2	50.77	54.73	30.2	9.39	1.99	30.2	22.75	46.76	30.3	15.89	26.13
31.1	36.76	13.93	31.1	50.41	54.55	31.2	7.86	1.88	31.2	21.41	46.68	31.3	15.70	26.19
32.1	36.38	13.70	32.1	50.04	54.38	32.2	6.36	1.75	32.2	20.08	46.60	32.3	15.52	26.24

16.97	+16.94	24.55	-24.53	59.32	+59.31	72.82	-72.81	7.42	+7.35
17 ^h 57 ^m 4 ^s .326		18 ^h 9 ^m 46 ^s .186		18 ^h 55 ^m 23 ^s .393		19 ^h 37 ^m 1 ^s .735		20 ^h 48 ^m 15 ^s .385	
+86° 36' 50".43		-87° 39' 48".39		+89° 1' 32".83		-89° 12' 41".41		+82° 14' 50".67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '	Oct.	h m	° '
	21 39	-83 4		22 17	-86 21		22 38	-81 47		23 28	+86 53		23 47	-82 26
	s	"		s	"		s	"		s	"		s	"
1.4	26.08	25.97	1.4	37.98	33.69	1.4	24.75	3.09	1.4	14.34	17.34	1.5	45.43	38.34
2.4	25.98	26.19	2.4	37.80	33.93	2.4	24.68	3.34	2.4	14.24	17.73	2.5	45.40	38.63
3.4	25.87	26.41	3.4	37.63	34.17	3.4	24.62	3.60	3.4	14.10	18.12	3.5	45.39	38.92
4.4	25.77	26.63	4.4	37.47	34.42	4.4	24.57	3.86	4.4	13.95	18.51	4.5	45.37	39.21
5.4	25.66	26.86	5.4	37.31	34.68	5.4	24.51	4.13	5.4	13.77	18.88	5.5	45.35	39.51
6.4	25.55	27.09	6.4	37.14	34.95	6.4	24.44	4.42	6.4	13.60	19.22	6.4	45.33	39.82
7.4	25.42	27.33	7.4	36.95	35.22	7.4	24.36	4.71	7.4	13.42	19.55	7.4	45.30	40.15
8.4	25.29	27.57	8.4	36.73	35.49	8.4	24.28	5.00	8.4	13.26	19.88	8.4	45.25	40.48
9.4	25.14	27.79	9.4	36.49	35.74	9.4	24.19	5.28	9.4	13.11	20.20	9.4	45.19	40.82
10.4	24.99	27.99	10.4	36.23	35.99	10.4	24.09	5.54	10.4	12.97	20.54	10.4	45.13	41.14
11.3	24.83	28.17	11.4	35.96	36.22	11.4	23.98	5.78	11.4	12.85	20.90	11.4	45.05	41.44
12.3	24.68	28.32	12.4	35.70	36.42	12.4	23.87	6.01	12.4	12.73	21.27	12.4	44.97	41.73
13.3	24.53	28.47	13.4	35.45	36.61	13.4	23.77	6.21	13.4	12.59	21.65	13.4	44.91	41.99
14.3	24.40	28.61	14.4	35.21	36.79	14.4	23.68	6.41	14.4	12.42	22.03	14.4	44.85	42.25
15.3	24.27	28.74	15.4	34.98	36.97	15.4	23.59	6.61	15.4	12 23	22.41	15.4	44.78	42.50
16.3	24.14	28.89	16.4	34.77	37.15	16.4	23.51	6.83	16.4	12.02	22.78	16.4	44.72	42.76
17.3	24.01	29.06	17.4	34.55	37.34	17.4	23.43	7.05	17.4	11.79	23.13	17.4	44.67	43.03
18.3	23.88	29.23	18.4	34.32	37.56	18.4	23.34	7.28	18.4	11.55	23.47	18.4	44.61	43.30
19.3	23.74	29.41	19.4	34.08	37.78	19.4	23.24	7.52	19.4	11.30	23.78	19.4	44.54	43.59
20.3	23.59	29.59	20.3	33.81	38.00	20.4	23.13	7.76	20.4	11.06	24.07	20.4	44.46	43.90
21.3	23.42	29.76	21.3	33.54	38.22	21.4	23.02	8.00	21.4	10.83	24.37	21.4	44.38	44.20
22.3	23.24	29.92	22.3	33.23	38.42	22.4	22.89	8.24	22.4	10.61	24.66	22.4	44.29	44.50
23.3	23.06	30.07	23.3	32.92	38.61	23.4	22.77	8.47	23.4	10.41	24.95	23.4	44.19	44.80
24.3	22.88	30.18	24.3	32.60	38.79	24.4	22.64	8.67	24.4	10.20	25.26	24.4	44.09	45.08
25.3	22.70	30.29	25.3	32.28	38.94	25.4	22.50	8.86	25.4	9.99	25.57	25.4	43.98	45.35
26.3	22.53	30.40	26.3	31.96	39.09	26.3	22.37	9.04	26.4	9.78	25.89	26.4	43.87	45.61
27.3	22.36	30.49	27.3	31.65	39.22	27.3	22.24	9.21	27.4	9.55	26.21	27.4	43.76	45.87
28.3	22.21	30.57	28.3	31.36	39.35	28.3	22.12	9.36	28.4	9.32	26.54	28.4	43.65	46.10
29.3	22.05	30.65	29.3	31.07	39.47	29.3	22.01	9.51	29.4	9.06	26.87	29.4	43.55	46.32
30.3	21.91	30.72	30.3	30.79	39.59	30.3	21.90	9.66	30.4	8.79	27.19	30.4	43.46	46.53
31.3	21.76	30.79	31.3	30.51	39.71	31.3	21.79	9.80	31.4	8.50	27.51	31.4	43.36	46.75
32.3	21.61	30.87	32.3	30.24	39.83	32.3	21.68	9.97	32.4	8.18	27.80	32.4	43.27	46.96
8.29	-8.23		15.75	-15.72		7.00	-6.93		18.43	+18.40		7.61	-7.54	
21 ^h 39 ^m 16 ^s .433			22 ^h 17 ^m 21 ^s .969			22 ^h 38 ^m 16 ^s .769			23 ^h 27 ^m 42 ^s .388			23 ^h 47 ^m 38 ^s .028		
-83° 4' 28''.91			-86° 21' 38''.42			-81° 47' 9''.68			+86° 52' 58''.09			-82° 26' 48''.40		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	0 58	+85 51	Nov.	1 34	+88 53	Nov.	1 41	-85 9	Nov.	4 12	+85 20	Nov.	5 37	+85 9
	s	"		s	"		s	"		s	"		s	"
0.4	24.47	1.57	0.5	64.21	49.02	0.5	46.28	28.47	0.6	18.48	57.31	0.6	29.90	22.64
1.4	24.37	1.94	1.5	64.00	49.41	1.5	46.23	28.76	1.6	18.66	57.65	1.6	30.15	22.88
2.4	24.24	2.29	2.4	63.73	49.79	2.5	46.19	29.05	2.6	18.81	57.99	2.6	30.38	23.13
3.4	24.11	2.63	3.4	63.43	50.16	3.5	46.13	29.37	3.6	18.95	58.32	3.6	30.60	23.38
4.4	23.98	2.96	4.4	63.14	50.51	4.4	46.07	29.68	4.6	19.09	58.64	4.6	30.82	23.62
5.4	23.88	3.29	5.4	62.89	50.85	5.4	45.98	30.02	5.5	19.22	58.93	5.6	31.02	23.84
6.4	23.78	3.61	6.4	62.69	51.18	6.4	45.89	30.35	6.5	19.36	59.22	6.6	31.24	24.04
7.4	23.69	3.93	7.4	62.54	51.51	7.4	45.76	30.68	7.5	19.51	59.51	7.6	31.46	24.24
8.4	23.61	4.26	8.4	62.42	51.88	8.4	45.63	30.98	8.5	19.69	59.80	8.6	31.70	24.45
9.4	23.53	4.62	9.4	62.29	52.25	9.4	45.50	31.27	9.5	19.86	60.10	9.6	31.95	24.66
10.4	23.44	4.98	10.4	62.12	52.63	10.4	45.36	31.53	10.5	20.04	60.42	10.6	32.22	24.88
11.4	23.33	5.35	11.4	61.88	53.03	11.4	45.24	31.79	11.5	20.22	60.75	11.6	32.47	25.12
12.4	23.20	5.71	12.4	61.57	53.42	12.4	45.13	32.05	12.5	20.37	61.12	12.6	32.71	25.39
13.4	23.05	6.05	13.4	61.16	53.80	13.4	45.02	32.30	13.5	20.52	61.48	13.6	32.94	25.67
14.4	22.88	6.39	14.4	60.70	54.18	14.4	44.91	32.56	14.5	20.63	61.84	14.6	33.15	25.97
15.4	22.71	6.71	15.4	60.20	54.53	15.4	44.81	32.83	15.5	20.73	62.20	15.6	33.35	26.27
16.4	22.53	7.00	16.4	59.69	54.86	16.4	44.68	33.11	16.5	20.81	62.54	16.6	33.53	26.55
17.4	22.34	7.29	17.4	59.19	55.19	17.4	44.56	33.40	17.5	20.89	62.87	17.6	33.70	26.82
18.4	22.16	7.57	18.4	58.70	55.48	18.4	44.43	33.70	18.5	20.95	63.20	18.6	33.85	27.09
19.4	22.01	7.85	19.4	58.22	55.79	19.4	44.27	33.99	19.5	21.03	63.50	19.6	34.02	27.34
20.4	21.86	8.12	20.4	57.77	56.10	20.4	44.10	34.28	20.5	21.11	63.81	20.6	34.19	27.58
21.4	21.70	8.39	21.4	57.34	56.41	21.4	43.93	34.56	21.5	21.20	64.12	21.6	34.35	27.83
22.4	21.54	8.67	22.4	56.90	56.73	22.4	43.76	34.83	22.5	21.30	64.44	22.6	34.53	28.08
23.4	21.39	8.96	23.4	56.47	57.04	23.4	43.58	35.07	23.5	21.39	64.76	23.6	34.71	28.35
24.4	21.22	9.26	24.4	56.01	57.36	24.4	43.39	35.31	24.5	21.49	65.09	24.6	34.89	28.63
25.4	21.05	9.56	25.4	55.51	57.70	25.4	43.21	35.53	25.5	21.58	65.43	25.6	35.08	28.91
26.4	20.87	9.86	26.4	54.97	58.03	26.4	43.03	35.73	26.5	21.67	65.79	26.6	35.27	29.20
27.4	20.68	10.16	27.4	54.35	58.37	27.4	42.85	35.93	27.5	21.74	66.16	27.6	35.45	29.52
28.4	20.45	10.45	28.4	53.67	58.70	28.4	42.68	36.13	28.5	21.80	66.54	28.5	35.60	29.85
29.4	20.22	10.72	29.4	52.93	59.02	29.4	42.53	36.33	29.5	21.84	66.91	29.5	35.75	30.18
30.3	19.98	10.97	30.4	52.17	59.32	30.4	42.37	36.55	30.5	21.86	67.28	30.5	35.88	30.51
31.3	19.74	11.22	31.4	51.38	59.61	31.4	42.20	36.77	31.5	21.87	67.62	31.5	36.00	30.84
13.82	+13.79		52.02	+52.01		11.85	-11.81		12.34	+12.30		11.85	+11.80	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	5 45	-84 49	Nov.	6 46	-80 43	Nov.	7 5	+87 9	Nov.	7 14	-86 54	Nov.	7 15	+82 33
	s	"		s	"		s	"		s	"		s	"
0.6	6.38	31.90	0.7	30.05	55.15	0.7	25.58	52.18	0.7	16.65	39.54	0.7	10.00	21.94
1.6	6.55	32.11	1.7	30.18	55.31	1.7	26.11	52.30	1.7	16.99	39.65	1.7	10.21	22.03
2.6	6.72	32.33	2.7	30.30	55.47	2.7	26.61	52.43	2.7	17.35	39.75	2.7	10.41	22.14
3.6	6.89	32.55	3.7	30.42	55.64	3.7	27.09	52.55	3.7	17.72	39.87	3.7	10.60	22.24
4.6	7.07	32.78	4.7	30.54	55.81	4.7	27.55	52.66	4.7	18.10	40.00	4.7	10.78	22.33
5.6	7.25	33.05	5.7	30.66	56.00	5.7	28.00	52.77	5.7	18.49	40.15	5.7	10.96	22.42
6.6	7.40	33.32	6.7	30.79	56.22	6.7	28.45	52.87	6.7	18.87	40.33	6.7	11.13	22.48
7.6	7.56	33.61	7.7	30.90	56.46	7.7	28.90	52.95	7.7	19.25	40.53	7.7	11.31	22.54
8.6	7.70	33.93	8.6	31.01	56.73	8.7	29.37	53.03	8.7	19.59	40.76	8.7	11.49	22.60
9.6	7.82	34.23	9.6	31.12	57.00	9.7	29.88	53.11	9.7	19.92	40.98	9.7	11.69	22.68
10.6	7.93	34.54	10.6	31.22	57.25	10.7	30.39	53.21	10.7	20.21	41.19	10.7	11.90	22.76
11.6	8.04	34.83	11.6	31.32	57.49	11.7	30.92	53.34	11.7	20.50	41.39	11.7	12.11	22.85
12.6	8.15	35.10	12.6	31.41	57.71	12.7	31.45	53.48	12.7	20.79	41.59	12.7	12.32	22.96
13.6	8.26	35.34	13.6	31.50	57.93	13.6	31.91	53.63	13.7	21.07	41.77	13.7	12.53	23.09
14.6	8.39	35.59	14.6	31.60	58.16	14.6	32.42	53.81	14.7	21.38	41.95	14.7	12.72	23.24
15.6	8.52	35.86	15.6	31.70	58.38	15.6	32.86	54.00	15.6	21.69	42.13	15.7	12.90	23.40
16.6	8.64	36.14	16.6	31.80	58.61	16.6	33.29	54.18	16.6	22.01	42.32	16.6	13.07	23.57
17.6	8.77	36.42	17.6	31.90	58.85	17.6	33.71	54.36	17.6	22.33	42.54	17.6	13.24	23.73
18.6	8.89	36.73	18.6	32.00	59.12	18.6	34.09	54.54	18.6	22.66	42.76	18.6	13.39	23.88
19.6	9.00	37.05	19.6	32.10	59.39	19.6	34.48	54.71	19.6	22.99	43.00	19.6	13.55	24.02
20.6	9.11	37.38	20.6	32.20	59.68	20.6	34.87	54.88	20.6	23.30	43.26	20.6	13.70	24.16
21.6	9.21	37.73	21.6	32.29	59.98	21.6	35.28	55.04	21.6	23.59	43.53	21.6	13.86	24.30
22.6	9.30	38.08	22.6	32.38	60.29	22.6	35.69	55.21	22.6	23.88	43.80	22.6	14.03	24.44
23.6	9.38	38.42	23.6	32.46	60.61	23.6	36.11	55.37	23.6	24.16	44.08	23.6	14.20	24.57
24.6	9.44	38.76	24.6	32.54	60.92	24.6	36.54	55.54	24.6	24.40	44.36	24.6	14.37	24.72
25.6	9.50	39.09	25.6	32.60	61.23	25.6	36.98	55.72	25.6	24.64	44.64	25.6	14.55	24.87
26.6	9.56	39.41	26.6	32.67	61.52	26.6	37.41	55.91	26.6	24.87	44.92	26.6	14.73	25.05
27.6	9.62	39.72	27.6	32.73	61.81	27.6	37.85	56.14	27.6	25.07	45.17	27.6	14.91	25.24
28.6	9.67	40.01	28.6	32.80	62.09	28.6	38.28	56.37	28.6	25.28	45.41	28.6	15.08	25.47
29.5	9.72	40.31	29.6	32.87	62.37	29.6	38.68	56.61	29.6	25.50	45.66	29.6	15.23	25.69
30.5	9.78	40.61	30.6	32.94	62.65	30.6	39.05	56.88	30.6	25.72	45.92	30.6	15.39	25.91
31.5	9.83	40.92	31.6	33.01	62.94	31.6	39.39	57.13	31.6	25.96	46.18	31.6	15.53	26.14
11.09	-11.05		6.21	-6.13		20.22	+20.19		18.56	-18.53		7.72	+7.65	
5 ^h 45 ^m	4 ^s .700		6 ^h 46 ^m	28 ^s .850		7 ^h 4 ^m	58 ^s .549		7 ^h 14 ^m	18 ^s .185		7 ^h 14 ^m	59 ^s .083	
-84° 49'	38'' .84		-80° 44'	2'' .02		+87° 10'	21'' .62		-86° 54'	45'' .50		+82° 33'	51'' .51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "		h m	° ' "
Nov.	8 22	+88 51	Nov.	9 8	-85 21	Nov.	9 26	+81 39	Nov.	9 36	-80 35	Nov.	10 21	+82 56
	s	"		s	"		s	"		s	"		s	"
0.7	10.06	17.90	0.8	6.38	21.30	0.8	15.45	33.38	0.8	12.12	40.39	0.8	46.53	32.22
1.7	11.41	17.89	1.8	6.62	21.27	1.8	15.63	33.24	1.8	12.25	40.33	1.8	46.72	32.01
2.7	12.71	17.89	2.8	6.87	21.23	2.8	15.81	33.12	2.8	12.38	40.27	2.8	46.91	31.81
3.7	13.95	17.89	3.8	7.14	21.19	3.8	15.97	33.03	3.8	12.50	40.21	3.8	47.09	31.61
4.7	15.14	17.89	4.8	7.42	21.17	4.8	16.14	32.92	4.8	12.64	40.16	4.8	47.26	31.43
5.7	16.30	17.89	5.8	7.70	21.17	5.8	16.29	32.82	5.8	12.78	40.11	5.8	47.43	31.25
6.7	17.44	17.87	6.8	7.99	21.20	6.8	16.44	32.70	6.8	12.92	40.10	6.8	47.59	31.06
7.7	18.59	17.84	7.7	8.29	21.23	7.8	16.60	32.57	7.8	13.07	40.10	7.8	47.75	30.84
8.7	19.79	17.81	8.7	8.58	21.29	8.8	16.77	32.42	8.8	13.22	40.14	8.8	47.93	30.62
9.7	21.07	17.78	9.7	8.86	21.38	9.8	16.94	32.27	9.8	13.37	40.19	9.8	48.11	30.39
10.7	22.39	17.75	10.7	9.13	21.46	10.8	17.12	32.12	10.8	13.51	40.24	10.8	48.29	30.17
11.7	23.74	17.75	11.7	9.37	21.53	11.8	17.32	31.98	11.8	13.65	40.30	11.8	48.49	29.97
12.7	25.12	17.77	12.7	9.61	21.59	12.7	17.51	31.88	12.8	13.78	40.35	12.8	48.70	29.77
13.7	26.46	17.81	13.7	9.86	21.65	13.7	17.70	31.78	13.8	13.91	40.37	13.8	48.91	29.58
14.7	27.76	17.87	14.7	10.11	21.70	14.7	17.89	31.72	14.7	14.04	40.39	14.8	49.12	29.43
15.7	29.01	17.95	15.7	10.37	21.75	15.7	18.07	31.67	15.7	14.16	40.43	15.8	49.32	29.30
16.7	30.20	18.02	16.7	10.64	21.80	16.7	18.25	31.63	16.7	14.30	40.45	16.8	49.51	29.19
17.7	31.35	18.08	17.7	10.91	21.87	17.7	18.41	31.59	17.7	14.44	40.48	17.8	49.70	29.07
18.7	32.46	18.14	18.7	11.19	21.95	18.7	18.58	31.56	18.7	14.58	40.53	18.8	49.89	28.95
19.7	33.56	18.21	19.7	11.47	22.05	19.7	18.73	31.52	19.7	14.72	40.59	19.8	50.06	28.82
20.7	34.66	18.27	20.7	11.75	22.17	20.7	18.89	31.48	20.7	14.87	40.67	20.8	50.23	28.70
21.7	35.77	18.33	21.7	12.03	22.29	21.7	19.04	31.44	21.7	15.02	40.76	21.8	50.41	28.57
22.7	36.89	18.39	22.7	12.31	22.42	22.7	19.22	31.38	22.7	15.17	40.86	22.8	50.60	28.44
23.7	38.05	18.45	23.7	12.58	22.57	23.7	19.38	31.33	23.7	15.31	40.99	23.8	50.79	28.30
24.7	39.23	18.51	24.7	12.82	22.73	24.7	19.56	31.28	24.7	15.45	41.12	24.8	50.98	28.17
25.7	40.45	18.59	25.7	13.07	22.89	25.7	19.74	31.23	25.7	15.59	41.25	25.8	51.18	28.05
26.7	41.70	18.68	26.7	13.31	23.05	26.7	19.93	31.19	26.7	15.72	41.39	26.7	51.40	27.94
27.7	42.95	18.80	27.7	13.54	23.21	27.7	20.11	31.18	27.7	15.84	41.53	27.7	51.62	27.84
28.7	44.19	18.93	28.7	13.77	23.36	28.7	20.30	31.19	28.7	15.97	41.66	28.7	51.84	27.75
29.7	45.39	19.06	29.7	14.00	23.49	29.7	20.49	31.23	29.7	16.09	41.78	29.7	52.05	27.68
30.7	46.53	19.21	30.7	14.22	23.62	30.7	20.67	31.26	30.7	16.21	41.90	30.7	52.26	27.63
31.6	47.62	19.37	31.7	14.46	23.76	31.7	20.84	31.30	31.7	16.35	42.02	31.7	52.46	27.59
50.04	+50.03		12.35	-12.31		6.89	+6.82		6.12	-6.04		8.14	+8.08	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m 10 59	° ' -84 10	Nov.	h m 12 13	° ' +88 7	Nov.	h m 12 46	° ' -84 42	Nov.	h m 12 48	° ' +83 49	Nov.	h m 13 28	° ' -85 23
	s 50.92	" 45.52		s 42.23	" 11.93		s 40.96	" 21.62		s 17.69	" 32.96		s 7.10	" 36.65
0.8	51.09	45.35	0.9	42.65	11.58	0.9	41.07	21.38	1.9	17.79	32.59	1.9	7.18	36.37
1.8	51.26	45.18	2.9	43.07	11.25	2.9	41.17	21.11	2.9	17.89	32.23	2.9	7.26	36.09
3.8	51.43	45.01	3.9	43.49	10.94	3.9	41.28	20.83	3.9	17.99	31.89	3.9	7.34	35.80
4.8	51.61	44.83	4.9	43.89	10.65	4.9	41.41	20.56	4.9	18.09	31.55	4.9	7.43	35.50
5.8	51.80	44.67	5.9	44.27	10.35	5.9	41.54	20.28	5.9	18.17	31.22	5.9	7.55	35.19
6.8	52.03	44.52	6.9	44.61	10.04	6.9	41.71	20.01	6.9	18.25	30.90	6.9	7.69	34.88
7.8	52.25	44.41	7.9	44.94	9.73	7.9	41.88	19.76	7.9	18.33	30.56	7.9	7.85	34.59
8.8	52.48	44.31	8.9	45.28	9.41	8.9	42.07	19.52	8.9	18.40	30.20	8.9	8.03	34.31
9.8	52.70	44.25	9.9	45.64	9.08	9.9	42.26	19.31	9.9	18.48	29.83	9.9	8.21	34.06
10.8	52.90	44.19	10.9	46.04	8.73	10.9	42.45	19.11	10.9	18.58	29.46	10.9	8.39	33.83
11.8	53.11	44.13	11.9	46.49	8.38	11.9	42.64	18.93	11.9	18.71	29.08	11.9	8.56	33.61
12.8	53.31	44.05	12.9	46.96	8.05	12.9	42.80	18.75	12.9	18.83	28.70	12.9	8.71	33.39
13.8	53 50	43.97	13.9	47.48	7.73	13.9	42.95	18.56	13.9	18.97	28.36	13.9	8.86	33.17
14.8	53.69	43.88	14.9	48.03	7.44	14.9	43.11	18.37	14.9	19.11	28.02	14.9	9.00	32.94
15.8	53.88	43.79	15.9	48.56	7.16	15.9	43.26	18.15	15.9	19.25	27.70	15.9	9.14	32.69
16.8	54.07	43.69	16.9	49.09	6.89	16.9	43.42	17.93	16.9	19.38	27.39	16.9	9.28	32.42
17.8	54.30	43.60	17.8	49.60	6.65	17.9	43.59	17.69	17.9	19.51	27.10	17.9	9.45	32.15
18.8	54.52	43.52	18.8	50.08	6.41	18.9	43.77	17.46	18.9	19.64	26.81	18.9	9.62	31.88
19.8	54.74	43.46	19.8	50.56	6.17	19.9	43.96	17.26	19.9	19.76	26.52	19.9	9.81	31.63
20.8	54.97	43.40	20.8	51.03	5.92	20.9	44.18	17.06	20.9	19.89	26.24	20.9	10.00	31.38
21.8	55.21	43.35	21.8	51.50	5.65	21.9	44.40	16.87	21.9	20.01	25.95	21.9	10.23	31.14
22.8	55.45	43.33	22.8	51.97	5.39	22.9	44.62	16.69	22.9	20.13	25.66	22.9	10.45	30.92
23.8	55.68	43.32	23.8	52.45	5.13	23.9	44.85	16.54	23.9	20.27	25.36	23.9	10.67	30.71
24.8	55.91	43.33	24.8	52.96	4.86	24.9	45.07	16.40	24.9	20.41	25.03	24.9	10.90	30.52
25.8	56.13	43.35	25.8	53.50	4.59	25.9	45.29	16.27	25.9	20.56	24.72	25.9	11.13	30.34
26.8	56.35	43.36	26.8	54.08	4.32	26.8	45.51	16.15	26.8	20.71	24.40	26.9	11.34	30.17
27.8	56.55	43.38	27.8	54.69	4.07	27.8	45.71	16.03	27.8	20.88	24.11	27.9	11.55	30.01
28.8	56.76	43.40	28.8	55.34	3.83	28.8	45.91	15.90	28.8	21.06	23.81	28.9	11.75	29.84
29.8	56.96	43.41	29.8	56.00	3.60	29.8	46.11	15.78	29.8	21.24	23.53	29.9	11.95	29.68
30.8	57.16	43.41	30.8	56.64	3.40	30.8	46.30	15.65	30.8	21.42	23.26	30.9	12.15	29.50
31.8	57.38	43.41	31.8	57.26	3.21	31.8	46.50	15.50	31.8	21.60	23.01	31.9	12.35	29.31
9.86	-9.81		30.46	+30.44		10.84	-10.79		9.30	+9.24		12.45	-12.41	
10 ^h 59 ^m 53 ^s .036			12 ^h 14 ^m 30 ^s .802			12 ^h 46 ^m 43 ^s .161			12 ^h 48 ^m 33 ^s .111			13 ^h 28 ^m 9 ^s .628		
-84° 10' 46".79			+88° 7' 36".40			-84° 42' 20".01			+83° 49' 52".98			-85° 23' 33".94		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov.	14 14	-83 18	Nov.	15 0	+87 31	Nov.	15 25	-84 12	Nov.	16 53	+82 10	Nov.	17 17	-80 47
	s	"		s	"		s	"		s	"		s	"
0.9	22.89	64.91	1.0	53.88	45.06	1.0	17.03	50.03	1.1	34.62	14.19	1.1	3.83	34.62
1.9	22.92	64.63	2.0	53.77	44.66	2.0	17.00	49.76	2.1	34.51	13.88	2.1	3.75	34.40
2.9	22.93	64.35	3.0	53.69	44.28	3.0	16.96	49.47	3.1	34.40	13.56	3.1	3.67	34.18
3.9	22.96	64.04	4.0	53.61	43.91	4.0	16.91	49.16	4.1	34.30	13.26	4.1	3.59	33.95
4.9	22.99	63.72	5.0	53.53	43.55	5.0	16.88	48.84	5.1	34.20	12.97	5.1	3.50	33.71
5.9	23.03	63.39	6.0	53.44	43.21	6.0	16.87	48.50	6.1	34.10	12.69	6.1	3.42	33.44
6.9	23.09	63.07	6.9	53.34	42.87	7.0	16.86	48.16	7.1	33.99	12.42	7.1	3.36	33.15
7.9	23.18	62.76	7.9	53.22	42.53	8.0	16.88	47.82	8.1	33.88	12.16	8.1	3.31	32.85
8.9	23.26	62.47	8.9	53.08	42.17	9.0	16.92	47.49	9.1	33.77	11.89	9.1	3.27	32.56
9.9	23.35	62.18	9.9	52.94	41.81	10.0	16.96	47.18	10.1	33.66	11.58	10.1	3.24	32.27
10.9	23.45	61.91	10.9	52.80	41.43	11.0	17.01	46.89	11.1	33.54	11.27	11.1	3.21	31.99
11.9	23.54	61.67	11.9	52.71	41.02	12.0	17.06	46.61	12.1	33.44	10.94	12.1	3.18	31.73
12.9	23.63	61.43	12.9	52.66	40.61	12.9	17.10	46.34	13.1	33.35	10.59	13.1	3.15	31.50
13.9	23.69	61.18	13.9	52.64	40.20	13.9	17.13	46.06	14.1	33.26	10.24	14.1	3.12	31.25
14.9	23.76	60.91	14.9	52.65	39.81	14.9	17.14	45.78	15.1	33.17	9.89	15.1	3.08	31.00
15.9	23.83	60.63	15.9	52.69	39.43	15.9	17.16	45.49	16.1	33.09	9.54	16.1	3.03	30.73
16.9	23.90	60.36	16.9	52.72	39.06	16.9	17.18	45.17	17.0	33.01	9.20	17.1	2.98	30.47
17.9	23.98	60.07	17.9	52.76	38.72	17.9	17.21	44.85	18.0	32.95	8.87	18.1	2.93	30.18
18.9	24.07	59.78	18.9	52.77	38.37	18.9	17.24	44.53	19.0	32.88	8.55	19.1	2.88	29.87
19.9	24.16	59.49	19.9	52.79	38.03	19.9	17.28	44.20	20.0	32.82	8.23	20.1	2.84	29.56
20.9	24.27	59.20	20.9	52.81	37.69	20.9	17.34	43.87	21.0	32.75	7.92	21.1	2.81	29.24
21.9	24.40	58.91	21.9	52.82	37.35	21.9	17.42	43.54	22.0	32.69	7.61	22.0	2.80	28.92
22.9	24.52	58.64	22.9	52.83	37.01	22.9	17.50	43.22	23.0	32.63	7.30	23.0	2.78	28.61
23.9	24.65	58.40	23.9	52.86	36.64	23.9	17.58	42.92	24.0	32.56	6.97	24.0	2.77	28.30
24.9	24.79	58.16	24.9	52.89	36.28	24.9	17.68	42.63	25.0	32.49	6.64	25.0	2.77	27.98
25.9	24.93	57.94	25.9	52.93	35.90	25.9	17.78	42.36	26.0	32.42	6.27	26.0	2.77	27.69
26.9	25.07	57.73	26.9	53.00	35.52	26.9	17.87	42.09	27.0	32.35	5.90	27.0	2.77	27.41
27.9	25.20	57.53	27.9	53.09	35.13	27.9	17.96	41.82	28.0	32.30	5.52	28.0	2.78	27.15
28.9	25.31	57.32	28.9	53.21	34.74	28.9	18.06	41.58	29.0	32.25	5.14	29.0	2.78	26.89
29.9	25.42	57.12	29.9	53.37	34.36	29.9	18.15	41.32	30.0	32.22	4.75	30.0	2.78	26.62
30.9	25.53	56.90	30.9	53.54	34.00	30.9	18.21	41.05	31.0	32.19	4.38	31.0	2.77	26.34
31.9	25.66	56.67	31.9	53.71	33.66	31.9	18.29	40.77	32.0	32.16	4.01	32.0	2.76	26.05
8.59	-8.53		23.18	+23.16		9.92	-9.87		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m	23°.592		15 ^h 1 ^m	45°.970		15 ^h 25 ^m	17°.036		16 ^h 53 ^m	48°.037		17 ^h 17 ^m	1°.936	
-83° 19'	1''42		+87° 31'	46''68		-84° 12'	45''34		+82° 9'	58''64		-80° 47'	29''50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
Nov. 17 56	+86 37		Nov. 18 9	-87 39		Nov. 18 53	+89 1		Nov. 19 36	-89 12		Nov. 20 48	+82 15	
	s	"		s	"		s	"		s	"		s	"
1.1 36.38	13.70		1.1 50.04	54.38		1.2 66.36	61.75		1.2 80.08	46.60		1.3 15.52	26.24	
2.1 36.01	13.46		2.1 49.66	54.21		2.2 64.91	61.61		2.2 78.69	46.53		2.3 15.33	26.29	
3.1 35.68	13.23		3.1 49.26	54.03		3.2 63.53	61.46		3.2 77.24	46.45		3.3 15.15	26.32	
4.1 35.35	12.99		4.1 48.84	53.84		4.2 62.20	61.31		4.2 75.72	46.36		4.2 14.97	26.33	
5.1 35.03	12.77		5.1 48.41	53.62		5.2 60.92	61.17		5.2 74.17	46.26		5.2 14.80	26.36	
6.1 34.72	12.57		6.1 48.00	53.38		6.2 59.65	61.04		6.2 72.60	46.12		6.2 14.65	26.40	
7.1 34.40	12.38		7.1 47.62	53.11		7.2 58.37	60.93		7.2 71.06	45.97		7.2 14.48	26.44	
8.1 34.07	12.20		8.1 47.27	52.84		8.2 57.05	60.83		8.2 69.59	45.79		8.2 14.31	26.50	
9.1 33.73	12.00		9.1 46.97	52.57		9.2 55.67	60.72		9.2 68.24	45.60		9.2 14.15	26.56	
10.1 33.37	11.80		10.1 46.70	52.30		10.2 54.24	60.59		10.2 66.99	45.42		10.2 13.97	26.62	
11.1 33.01	11.57		11.1 46.46	52.06		11.1 52.78	60.46		11.2 65.81	45.23		11.2 13.80	26.67	
12.1 32.67	11.33		12.1 46.22	51.81		12.1 51.32	60.29		12.2 64.68	45.05		12.2 13.61	26.69	
13.1 32.33	11.05		13.1 45.97	51.58		13.1 49.89	60.12		13.2 63.54	44.89		13.2 13.43	26.69	
14.1 32.01	10.77		14.1 45.70	51.34		14.1 48.52	59.93		14.2 62.36	44.74		14.2 13.23	26.66	
15.1 31.72	10.48		15.1 45.42	51.13		15.1 47.23	59.73		15.2 61.13	44.60		15.2 13.05	26.62	
16.1 31.45	10.19		16.1 45.11	50.89		16.1 46.02	59.50		16.2 59.83	44.46		16.2 12.87	26.57	
17.1 31.19	9.91		17.1 44.79	50.63		17.1 44.86	59.30		17.2 58.48	44.29		17.2 12.70	26.52	
18.1 30.94	9.64		18.1 44.47	50.36		18.1 43.74	59.10		18.2 57.13	44.11		18.2 12.53	26.47	
19.1 30.69	9.37		19.1 44.17	50.09		19.1 42.64	58.92		19.2 55.77	43.91		19.2 12.38	26.42	
20.1 30.44	9.13		20.1 43.88	49.79		20.1 41.55	58.73		20.2 54.43	43.69		20.2 12.22	26.37	
21.1 30.19	8.88		21.1 43.62	49.48		21.1 40.45	58.55		21.2 53.13	43.46		21.2 12.06	26.34	
22.1 29.94	8.63		22.1 43.38	49.16		22.1 39.34	58.36		22.1 51.89	43.22		22.2 11.90	26.30	
23.1 29.67	8.38		23.1 43.18	48.84		23.1 38.20	58.18		23.1 50.73	42.98		23.2 11.74	26.26	
24.1 29.41	8.11		24.1 42.99	48.52		24.1 37.04	57.99		24.1 49.64	42.74		24.2 11.57	26.22	
25.1 29.14	7.83		25.1 42.83	48.23		25.1 35.85	57.79		25.1 48.64	42.49		25.2 11.40	26.18	
26.1 28.89	7.54		26.1 42.69	47.93		26.1 34.66	57.57		26.1 47.69	42.23		26.2 11.24	26.12	
27.1 28.64	7.23		27.1 42.57	47.64		27.1 33.49	57.33		27.1 46.79	41.99		27.2 11.06	26.03	
28.1 28.39	6.91		28.1 42.44	47.36		28.1 32.30	57.06		28.1 45.91	41.75		28.2 10.89	25.93	
29.1 28.16	6.57		29.1 42.30	47.10		29.1 31.20	56.79		29.1 45.02	41.53		29.2 10.70	25.83	
30.1 27.95	6.24		30.1 42.15	46.83		30.1 30.14	56.52		30.1 44.09	41.32		30.2 10.53	25.69	
31.1 27.76	5.90		31.1 41.96	46.55		31.1 29.17	56.25		31.1 43.11	41.09		31.2 10.38	25.55	
32.1 27.59	5.57		32.1 41.79	46.24		32.1 28.26	55.97		32.1 42.07	40.85		32.2 10.22	25.41	
16.96	+16.93		24.54	-24.52		59.27	+59.26		72.75	-72.74		7.42	+7.35	
17 ^h 57 ^m 4 ^s .326			18 ^h 9 ^m 46 ^s .186			18 ^h 55 ^m 23 ^s .393			19 ^h 37 ^m 1 ^s .735			20 ^h 48 ^m 15 ^s .385		
+86° 36' 50".43			-87° 39' 48".39			+89° 1' 32".83			-89° 12' 41".41			+82° 14' 50".67		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Nov.	h m 21 39	° ' -83 4	Nov.	h m 22 17	° ' -86 21	Nov.	h m 22 38	° ' -81 47	Nov.	h m 23 27	° ' +86 53	Nov.	h m 23 47	° ' -82 26
	s "	"		s "	"		s "	"		s "	"		s "	"
1.3	21.61	30.87	1.3	30.24	39.83	1.3	21.68	9.97	1.4	68.18	27.80	1.4	43.27	46.96
2.3	21.46	30.96	2.3	29.96	39.97	2.3	21.57	10.14	2.4	67.86	28.08	2.4	43.18	47.19
3.3	21.29	31.06	3.3	29.68	40.10	3.3	21.44	10.31	3.4	67.54	28.34	3.4	43.07	47.44
4.3	21.12	31.15	4.3	29.37	40.24	4.3	21.31	10.48	4.4	67.23	28.59	4.4	42.95	47.68
5.3	20.94	31.24	5.3	29.05	40.36	5.3	21.17	10.63	5.4	66.94	28.84	5.4	42.83	47.93
6.3	20.75	31.29	6.3	28.69	40.47	6.3	21.02	10.78	6.4	66.65	29.09	6.4	42.70	48.17
7.3	20.56	31.33	7.3	28.33	40.56	7.3	20.87	10.89	7.3	66.38	29.36	7.4	42.57	48.37
8.3	20.38	31.34	8.3	27.99	40.62	8.3	20.73	11.00	8.3	66.12	29.62	8.4	42.43	48.57
9.3	20.20	31.33	9.3	27.64	40.67	9.3	20.58	11.08	9.3	65.86	29.90	9.4	42.28	48.75
10.3	20.04	31.31	10.3	27.30	40.70	10.3	20.44	11.14	10.3	65.57	30.19	10.4	42.14	48.89
11.3	19.89	31.30	11.3	26.99	40.72	11.3	20.31	11.20	11.3	65.25	30.48	11.3	42.02	49.04
12.3	19.74	31.28	12.3	26.70	40.75	12.3	20.19	11.25	12.3	64.92	30.77	12.3	41.90	49.18
13.3	19.59	31.27	13.3	26.42	40.79	13.3	20.07	11.33	13.3	64.55	31.02	13.3	41.77	49.34
14.3	19.44	31.28	14.3	26.13	40.83	14.3	19.95	11.41	14.3	64.18	31.27	14.3	41.66	49.50
15.3	19.27	31.29	15.3	25.82	40.88	15.3	19.82	11.51	15.3	63.81	31.49	15.3	41.55	49.67
16.2	19.10	31.30	16.3	25.51	40.93	16.3	19.68	11.60	16.3	63.44	31.69	16.3	41.42	49.85
17.2	18.93	31.31	17.3	25.18	41.00	17.3	19.54	11.69	17.3	63.08	31.88	17.3	41.28	50.04
18.2	18.75	31.32	18.3	24.84	41.06	18.3	19.39	11.78	18.3	62.74	32.07	18.3	41.14	50.22
19.2	18.56	31.31	19.3	24.47	41.09	19.3	19.24	11.86	19.3	62.40	32.25	19.3	40.99	50.39
20.2	18.38	31.27	20.3	24.11	41.10	20.3	19.09	11.92	20.3	62.07	32.43	20.3	40.83	50.55
21.2	18.19	31.23	21.3	23.75	41.10	21.3	18.93	11.97	21.3	61.74	32.62	21.3	40.66	50.70
22.2	18.01	31.17	22.3	23.39	41.10	22.3	18.78	11.99	22.3	61.41	32.82	22.3	40.50	50.83
23.2	17.83	31.08	23.3	23.04	41.07	23.3	18.63	12.00	23.3	61.07	33.02	23.3	40.35	50.94
24.2	17.67	30.99	24.3	22.70	41.03	24.3	18.48	12.00	24.3	60.74	33.22	24.3	40.19	51.04
25.2	17.51	30.90	25.3	22.37	40.99	25.3	18.33	11.99	25.3	60.37	33.42	25.3	40.05	51.13
26.2	17.36	30.80	26.2	22.05	40.92	26.3	18.20	11.98	26.3	60.00	33.62	26.3	39.90	51.20
27.2	17.22	30.71	27.2	21.74	40.87	27.3	18.07	11.96	27.3	59.62	33.81	27.3	39.76	51.28
28.2	17.08	30.62	28.2	21.45	40.82	28.3	17.95	11.96	28.3	59.20	33.99	28.3	39.63	51.35
29.2	16.94	30.53	29.2	21.16	40.78	29.3	17.83	11.95	29.3	58.78	34.14	29.3	39.50	51.43
30.2	16.79	30.46	30.2	20.87	40.75	30.3	17.69	11.94	30.3	58.35	34.28	30.3	39.35	51.52
31.2	16.64	30.39	31.2	20.55	40.72	31.2	17.55	11.94	31.3	57.94	34.41	31.3	39.21	51.61
32.2	16.47	30.31	32.2	20.23	40.68	32.2	17.41	11.95	32.3	57.53	34.51	32.3	39.07	51.70
8.29	-8.23		15.76	-15.73		7.00	-6.93		18.44	+18.42		7.61	-7.54	
21 ^h 39 ^m	16°.433		22 ^h 17 ^m	21°.969		22 ^h 38 ^m	16°.769		23 ^h 27 ^m	42°.388		23 ^h 47 ^m	38°.028	
-83° 4'	28''.91		-86° 21'	38''.42		-81° 47'	9''.68		+86° 52'	58''.09		-82° 26'	48''.40	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			α Ursæ Minoris. (Polaris.) Mag. 2.1			4 G. Octantis. Mag. 5.6			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 0 58	° ' +85 51	Dec.	h m 1 34	° ' +88 53	Dec.	h m 1 41	° ' -85 9	Dec.	h m 4 12	° ' +85 21	Dec.	h m 5 37	° ' +85 9
	s "	"		s "	"		s "	"		s "	"		s "	"
0.3	19.98	10.97	0.4	52.17	59.32	0.4	42.37	36.55	0.5	21.86	7.28	0.5	35.88	30.51
1.3	19.74	11.22	1.4	51.38	59.61	1.4	42.20	36.77	1.5	21.87	7.62	1.5	36.00	30.84
2.3	19.51	11.44	2.4	50.62	59.86	2.4	42.01	37.01	2.5	21.88	7.96	2.5	36.10	31.16
3.3	19.28	11.64	3.4	49.91	60.11	3.4	41.81	37.24	3.5	21.88	8.28	3.5	36.20	31.45
4.3	19.08	11.86	4.4	49.25	60.38	4.4	41.59	37.47	4.5	21.91	8.59	4.5	36.31	31.73
5.3	18.89	12.09	5.4	48.65	60.64	5.4	41.36	37.67	5.5	21.94	8.90	5.5	36.44	32.00
6.3	18.70	12.32	6.4	48.05	60.92	6.4	41.12	37.86	6.5	21.99	9.21	6.5	36.58	32.28
7.3	18.51	12.56	7.4	47.43	61.21	7.4	40.89	38.01	7.5	22.04	9.54	7.5	36.72	32.57
8.3	18.30	12.83	8.4	46.76	61.53	8.4	40.65	38.16	8.5	22.09	9.90	8.5	36.87	32.89
9.3	18.07	13.08	9.4	46.00	61.82	9.4	40.42	38.30	9.5	22.13	10.26	9.5	37.01	33.21
10.3	17.83	13.33	10.4	45.18	62.12	10.3	40.22	38.43	10.5	22.14	10.63	10.5	37.14	33.55
11.3	17.56	13.57	11.3	44.29	62.40	11.3	40.02	38.56	11.5	22.13	11.01	11.5	37.24	33.90
12.3	17.28	13.77	12.3	43.35	62.65	12.3	39.81	38.69	12.4	22.10	11.37	12.5	37.33	34.25
13.3	17.00	13.95	13.3	42.38	62.90	13.3	39.61	38.84	13.4	22.06	11.72	13.5	37.39	34.60
14.3	16.72	14.13	14.3	41.43	63.12	14.3	39.39	39.01	14.4	22.01	12.05	14.5	37.45	34.95
15.3	16.44	14.29	15.3	40.49	63.32	15.3	39.17	39.18	15.4	21.95	12.37	15.5	37.49	35.28
16.3	16.17	14.44	16.3	39.58	63.52	16.3	38.93	39.33	16.4	21.90	12.68	16.5	37.53	35.60
17.3	15.92	14.57	17.3	38.68	63.71	17.3	38.69	39.48	17.4	21.84	12.99	17.5	37.57	35.91
18.3	15.68	14.71	18.3	37.82	63.90	18.3	38.44	39.63	18.4	21.79	13.28	18.5	37.61	36.20
19.3	15.43	14.85	19.3	36.97	64.09	19.3	38.17	39.76	19.4	21.74	13.58	19.5	37.65	36.50
20.3	15.18	14.99	20.3	36.11	64.29	20.3	37.91	39.86	20.4	21.70	13.87	20.5	37.71	36.81
21.3	14.94	15.15	21.3	35.24	64.49	21.3	37.65	39.96	21.4	21.66	14.19	21.5	37.77	37.12
22.3	14.69	15.30	22.3	34.37	64.71	22.3	37.39	40.06	22.4	21.62	14.51	22.5	37.83	37.43
23.3	14.42	15.46	23.3	33.44	64.93	23.3	37.14	40.12	23.4	21.57	14.84	23.5	37.89	37.76
24.3	14.14	15.61	24.3	32.46	65.15	24.3	36.89	40.18	24.4	21.52	15.17	24.5	37.94	38.09
25.3	13.85	15.76	25.3	31.42	65.35	25.3	36.65	40.22	25.4	21.44	15.51	25.5	37.99	38.45
26.3	13.54	15.90	26.3	30.32	65.55	26.3	36.41	40.26	26.4	21.35	15.85	26.5	38.01	38.81
27.3	13.23	16.02	27.3	29.17	65.71	27.3	36.19	40.31	27.4	21.24	16.19	27.5	38.01	39.18
28.3	12.91	16.12	28.3	28.02	65.86	28.3	35.96	40.37	28.4	21.11	16.50	28.5	37.99	39.53
29.3	12.59	16.19	29.3	26.89	66.00	29.3	35.73	40.44	29.4	20.98	16.79	29.5	37.95	39.87
30.3	12.30	16.25	30.3	25.79	66.11	30.3	35.46	40.52	30.4	20.85	17.08	30.5	37.92	40.19
31.3	12.01	16.30	31.3	24.75	66.22	31.3	35.20	40.59	31.4	20.74	17.35	31.5	37.89	40.49
13.83	+13.80		52.13	+52.12		11.85	-11.81		12.34	+12.30		11.85	+11.81	
0 ^h 57 ^m 55 ^s .489			1 ^h 33 ^m 11 ^s .898			1 ^h 41 ^m 39 ^s .995			4 ^h 11 ^m 48 ^s .583			5 ^h 37 ^m 5 ^s .478		
+85° 50' 41".77			+88° 53' 34".33			-85° 9' 32".70			+85° 21' 5".69			+85° 9' 42".71		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

31 G. Mensæ. Mag. 6.2			ζ Mensæ. Mag. 5.6			51 H. Cephei. Mag. 5.3			7 G. Octantis. Mag. 6.4			25 H. Camelop Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 5 45	° ' -84 49	Dec.	h m 6 46	° ' -80 14	Dec.	h m 7 5	° ' +87 9	Dec.	h m 7 14	° ' -86 54	Dec.	h m 7 15	° ' +82 33
	s	"		s	"		s	"		s	"		s	"
0.5	9.78	40.61	0.6	32.94	2.65	0.6	39.05	56.88	0.6	25.72	45.92	0.6	15.39	25.91
1.5	9.83	40.92	1.6	33.01	2.94	1.6	39.39	57.13	1.6	25.96	46.18	1.6	15.53	26.14
2.5	9.90	41.24	2.6	33.08	3.25	2.6	39.72	57.38	2.6	26.20	46.45	2.6	15.67	26.37
3.5	9.95	41.60	3.6	33.15	3.57	3.6	40.03	57.61	3.6	26.43	46.75	3.6	15.80	26.57
4.5	10.00	41.97	4.6	33.22	3.92	4.6	40.35	57.82	4.6	26.66	47.07	4.6	15.94	26.77
5.5	10.02	42.36	5.6	33.27	4.29	5.6	40.68	58.02	5.6	26.86	47.40	5.6	16.07	26.95
6.5	10.03	42.73	6.6	33.32	4.66	6.6	41.05	58.23	6.6	27.04	47.74	6.6	16.22	27.13
7.5	10.03	43.10	7.6	33.36	5.02	7.6	41.43	58.45	7.6	27.19	48.08	7.6	16.38	27.32
8.5	10.01	43.44	8.6	33.40	5.36	8.6	41.81	58.68	8.6	27.32	48.41	8.6	16.54	27.52
9.5	10.00	43.77	9.6	33.44	5.71	9.6	42.19	58.92	9.6	27.44	48.73	9.6	16.70	27.75
10.5	9.98	44.09	10.6	33.47	6.04	10.6	42.57	59.20	10.6	27.56	49.04	10.6	16.85	27.99
11.5	9.97	44.40	11.6	33.51	6.35	11.6	42.91	59.48	11.6	27.68	49.33	11.6	17.00	28.26
12.5	9.96	44.69	12.6	33.55	6.66	12.6	43.23	59.78	12.6	27.81	49.62	12.6	17.14	28.53
13.5	9.96	45.00	13.6	33.59	6.97	13.6	43.51	60.08	13.6	27.94	49.91	13.6	17.26	28.81
14.5	9.97	45.33	14.5	33.62	7.29	14.6	43.76	60.38	14.6	28.09	50.22	14.6	17.36	29.08
15.5	9.97	45.67	15.5	33.66	7.63	15.6	44.00	60.67	15.6	28.24	50.53	15.6	17.46	29.35
16.5	9.97	46.01	16.5	33.70	7.99	16.6	44.23	60.95	16.6	28.38	50.86	16.6	17.56	29.62
17.5	9.94	46.37	17.5	33.73	8.35	17.6	44.45	61.22	17.6	28.51	51.20	17.6	17.66	29.86
18.5	9.91	46.73	18.5	33.76	8.72	18.6	44.67	61.48	18.6	28.62	51.56	18.6	17.75	30.11
19.5	9.87	47.10	19.5	33.77	9.09	19.6	44.90	61.74	19.6	28.72	51.92	19.6	17.85	30.35
20.5	9.83	47.47	20.5	33.79	9.47	20.5	45.14	62.01	20.6	28.81	52.29	20.6	17.95	30.59
21.5	9.77	47.83	21.5	33.80	9.85	21.5	45.39	62.27	21.6	28.87	52.65	21.6	18.05	30.84
22.5	9.71	48.17	22.5	33.81	10.22	22.5	45.64	62.54	22.5	28.92	53.01	22.6	18.16	31.11
23.5	9.63	48.50	23.5	33.81	10.59	23.5	45.89	62.83	23.5	28.95	53.36	23.5	18.27	31.37
24.5	9.55	48.82	24.5	33.81	10.92	24.5	46.14	63.14	24.5	28.96	53.70	24.5	18.39	31.65
25.5	9.47	49.13	25.5	33.80	11.26	25.5	46.38	63.46	25.5	28.97	54.02	25.5	18.50	31.96
26.5	9.40	49.42	26.5	33.80	11.59	26.5	46.59	63.80	26.5	28.98	54.33	26.5	18.60	32.27
27.5	9.33	49.72	27.5	38.80	11.90	27.5	46.79	64.15	27.5	29.00	54.63	27.5	18.68	32.60
28.5	9.26	50.02	28.5	33.80	12.23	28.5	46.94	64.49	28.5	29.04	54.95	28.5	18.74	32.92
29.5	9.19	50.33	29.5	33.80	12.57	29.5	47.07	64.82	29.5	29.08	55.28	29.5	18.80	33.23
30.5	9.12	50.66	30.5	33.80	12.93	30.5	47.17	65.15	30.5	29.11	55.62	30.5	18.86	33.53
31.5	9.03	51.02	31.5	33.80	13.31	31.5	47.27	65.44	31.5	29.12	55.99	31.5	18.91	33.81
11.10	-11.05		6.21	-6.13		20.23	+20.21		18.57	-18.55		7.72	+7.65	
5 ^h 45 ^m	4° 7'00		6 ^h 46 ^m	28° 8'50		7 ^h 4 ^m	58° 5'49		7 ^h 14 ^m	18° 1'85		7 ^h 14 ^m	59° 0'83	
-84° 49'	38'' 84		-80° 44'	2'' 02		+87° 10'	21'' 62		-86° 54'	45'' 50		+82° 33'	51'' 51	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			ζ Octantis. Mag. 5.4			1 H. Draconis. Mag. 4.6			ζ Chamæleontis. Mag. 5.2			30 H. Camelop. Mag. 5.3		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 8 22	° ' +88 51	Dec.	h m 9 8	° ' -85 21	Dec.	h m 9 26	° ' +81 39	Dec.	h m 9 36	° ' -80 35	Dec.	h m 10 21	° ' +82 56
	s	"		s	"		s	"		s	"		s	"
0.7	46.53	19.21	0.7	14.22	23.62	0.7	20.67	31.26	0.7	16.21	41.90	0.7	52.26	27.63
1.6	47.62	19.37	1.7	14.46	23.76	1.7	20.84	31.30	1.7	16.35	42.02	1.7	52.46	27.59
2.6	48.65	19.52	2.7	14.71	23.93	2.7	21.00	31.34	2.7	16.48	42.15	2.7	52.65	27.56
3.6	49.63	19.67	3.7	14.97	24.11	3.7	21.16	31.38	3.7	16.61	42.29	3.7	52.84	27.52
4.6	50.61	19.80	4.7	15.22	24.31	4.7	21.31	31.40	4.7	16.75	42.47	4.7	53.02	27.48
5.6	51.62	19.93	5.7	15.46	24.54	5.7	21.47	31.41	5.7	16.90	42.67	5.7	53.20	27.42
6.6	52.67	20.04	6.7	15.71	24.78	6.7	21.64	31.42	6.7	17.04	42.90	6.7	53.39	27.36
7.6	53.78	20.16	7.7	15.94	25.03	7.7	21.81	31.43	7.7	17.16	43.13	7.7	53.59	27.29
8.6	54.94	20.29	8.7	16.14	25.29	8.7	21.99	31.44	8.7	17.28	43.36	8.7	53.81	27.22
9.6	56.12	20.44	9.7	16.34	25.53	9.7	22.17	31.48	9.7	17.39	43.58	9.7	54.03	27.16
10.6	57.27	20.62	10.7	16.52	25.77	10.7	22.36	31.53	10.7	17.50	43.80	10.7	54.25	27.12
11.6	58.38	20.82	11.7	16.71	25.99	11.7	22.54	31.61	11.7	17.62	44.00	11.7	54.47	27.12
12.6	59.43	21.02	12.7	16.90	26.21	12.7	22.72	31.71	12.7	17.72	44.19	12.7	54.68	27.14
13.6	60.42	21.25	13.7	17.10	26.42	13.7	22.88	31.82	13.7	17.83	44.38	13.7	54.88	27.17
14.6	61.32	21.47	14.6	17.30	26.64	14.7	23.02	31.93	14.7	17.96	44.58	14.7	55.07	27.22
15.6	62.20	21.67	15.6	17.51	26.86	15.7	23.17	32.06	15.7	18.08	44.80	15.7	55.26	27.26
16.6	63.03	21.89	16.6	17.72	27.10	16.7	23.32	32.18	16.7	18.19	45.02	16.7	55.45	27.30
17.6	63.85	22.11	17.6	17.93	27.36	17.7	23.46	32.29	17.7	18.31	45.24	17.7	55.63	27.34
18.6	64.67	22.30	18.6	18.14	27.63	18.7	23.60	32.40	18.7	18.43	45.50	18.7	55.81	27.37
19.6	65.49	22.50	19.6	18.34	27.92	19.6	23.74	32.50	19.7	18.55	45.76	19.7	55.98	27.41
20.6	66.34	22.70	20.6	18.53	28.22	20.6	23.89	32.61	20.7	18.66	46.04	20.7	56.16	27.44
21.6	67.21	22.92	21.6	18.72	28.53	21.6	24.04	32.72	21.6	18.76	46.32	21.7	56.35	27.47
22.6	68.10	23.13	22.6	18.89	28.84	22.6	24.20	32.82	22.6	18.86	46.62	22.7	56.54	27.51
23.6	69.02	23.34	23.6	19.04	29.15	23.6	24.37	32.95	23.6	18.96	46.91	23.7	56.74	27.56
24.6	69.94	23.57	24.6	19.18	29.44	24.6	24.53	33.08	24.6	19.06	47.20	24.7	56.94	27.61
25.6	70.84	23.83	25.6	19.32	29.72	25.6	24.69	33.23	25.6	19.15	47.48	25.7	57.15	27.69
26.6	71.70	24.11	26.6	19.45	30.00	26.6	24.84	33.40	26.6	19.24	47.76	26.7	57.36	27.78
27.6	72.51	24.39	27.6	19.58	30.27	27.6	24.99	33.59	27.6	19.33	48.02	27.7	57.56	27.89
28.6	73.24	24.67	28.6	19.72	30.55	28.6	25.13	33.78	28.6	19.41	48.29	28.7	57.75	28.02
29.6	73.91	24.96	29.6	19.87	30.83	29.6	25.26	33.98	29.6	19.50	48.56	29.7	57.93	28.15
30.6	74.52	25.23	30.6	20.03	31.14	30.6	25.39	34.18	30.6	19.59	48.83	30.7	58.10	28.29
31.6	75.11	25.49	31.6	20.19	31.46	31.6	25.50	34.37	31.6	19.69	49.13	31.7	58.26	28.41
50.09	+50.08		12.35	-12.31		6.89	+6.82		6.12	-6.04		8.14	+8.08	
8 ^h 21 ^m 41 ^s .998			9 ^h 8 ^m 8 ^s .703			9 ^h 26 ^m 14 ^s .295			9 ^h 36 ^m 12 ^s .346			10 ^h 21 ^m 50 ^s .081		
+88° 51' 51".95			-85° 21' 25".35			+81° 40' 7".28			-80° 35' 44".11			+82° 57' 4".81		

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

η Octantis. Mag. 6.3			Bradley 1672. Mag. 6.3			ι Octantis. Mag. 5.4			32 H. Camelop. seq. Mag. 5.3			κ Octantis. Mag. 5.6		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '
	10 59	-84 10		12 13	+88 6		12 46	-84 42		12 48	+83 49		13 28	-85 23
	s	"		s	"		s	"		s	"		s	"
0.8	57.16	43.41	0.8	56.64	63.40	0.8	46.30	15.65	0.8	21.42	23.26	0.9	12.15	29.50
1.8	57.38	43.41	1.8	57.26	63.21	1.8	46.50	15.50	1.8	21.60	23.01	1.9	12.35	29.31
2.8	57.60	43.41	2.8	57.87	63.03	2.8	46.73	15.36	2.8	21.78	22.78	2.9	12.58	29.11
3.8	57.83	43.43	3.8	58.43	62.85	3.8	46.96	15.22	3.8	21.93	22.56	3.9	12.82	28.92
4.8	58.08	43.47	4.8	58.98	62.67	4.8	47.20	15.11	4.8	22.08	22.34	4.9	13.09	28.73
5.8	58.32	43.55	5.8	59.52	62.48	5.8	47.47	15.02	5.8	22.22	22.10	5.9	13.36	28.58
6.7	58.56	43.65	6.8	60.06	62.27	6.8	47.74	14.95	6.8	22.39	21.84	6.8	13.65	28.44
7.7	58.81	43.76	7.8	60.64	62.05	7.8	48.00	14.91	7.8	22.56	21.57	7.8	13.93	28.33
8.7	59.04	43.89	8.8	61.27	61.83	8.8	48.25	14.86	8.8	22.73	21.30	8.8	14.22	28.23
9.7	59.24	44.01	9.8	61.93	61.63	9.8	48.49	14.83	9.8	22.92	21.04	9.8	14.49	28.14
10.7	59.45	44.11	10.8	62.63	61.43	10.8	48.72	14.80	10.8	23.13	20.79	10.8	14.73	28.06
11.7	59.65	44.21	11.8	63.33	61.25	11.8	48.94	14.76	11.8	23.34	20.55	11.8	14.97	27.96
12.7	59.85	44.30	12.8	64.05	61.10	12.8	49.17	14.71	12.8	23.55	20.35	12.8	15.22	27.86
13.7	60.05	44.38	13.8	64.76	60.97	13.8	49.40	14.66	13.8	23.75	20.16	13.8	15.46	27.75
14.7	60.27	44.46	14.8	65.44	60.87	14.8	49.63	14.59	14.8	23.95	19.99	14.8	15.70	27.62
15.7	60.49	44.55	15.8	66.10	60.76	15.8	49.87	14.53	15.8	24.15	19.83	15.8	15.96	27.51
16.7	60.71	44.65	16.8	66.75	60.66	16.8	50.12	14.47	16.8	24.35	19.68	16.8	16.24	27.40
17.7	60.93	44.77	17.8	67.37	60.56	17.8	50.37	14.42	17.8	24.54	19.53	17.8	16.51	27.29
18.7	61.16	44.90	18.8	67.99	60.46	18.8	50.63	14.40	18.8	24.72	19.37	18.8	16.80	27.20
19.7	61.39	45.05	19.8	68.60	60.36	19.8	50.91	14.39	19.8	24.90	19.21	19.8	17.10	27.11
20.7	61.62	45.22	20.8	69.24	60.25	20.8	51.18	14.38	20.8	25.08	19.06	20.8	17.40	27.05
21.7	61.84	45.40	21.8	69.88	60.12	21.8	51.45	14.41	21.8	25.27	18.88	21.8	17.71	27.00
22.7	62.04	45.59	22.8	70.54	60.00	22.8	51.71	14.44	22.8	25.48	18.71	22.8	18.01	26.98
23.7	62.25	45.78	23.8	71.23	59.89	23.8	51.97	14.49	23.8	25.69	18.53	23.8	18.30	26.97
24.7	62.45	45.97	24.7	71.96	59.79	24.8	52.22	14.54	24.8	25.91	18.37	24.8	18.59	26.96
25.7	62.63	46.16	25.7	72.70	59.71	25.8	52.45	14.59	25.8	26.13	18.22	25.8	18.87	26.95
26.7	62.81	46.35	26.7	73.46	59.64	26.8	52.69	14.64	26.8	26.36	18.08	26.8	19.13	26.94
27.7	62.99	46.52	27.7	74.22	59.59	27.8	52.91	14.67	27.8	26.59	17.98	27.8	19.39	26.92
28.7	63.17	46.69	28.7	74.97	59.56	28.8	53.15	14.70	28.8	26.83	17.88	28.8	19.65	26.89
29.7	63.36	46.86	29.7	75.68	59.55	29.8	53.38	14.74	29.8	27.04	17.79	29.8	19.92	26.86
30.7	63.55	47.04	30.7	76.36	59.54	30.8	53.63	14.77	30.8	27.24	17.73	30.8	20.20	26.83
31.7	63.76	47.24	31.7	76.99	59.53	31.8	53.90	14.81	31.8	27.45	17.66	31.8	20.51	26.82
9.86	-9.81		30.43	+30.42		10.83	-10.79		9.29	+9.24		12.45	-12.40	
10 ^h 59 ^m	53 ^s .036		12 ^h 14 ^m	30 ^s .802		12 ^h 46 ^m	43 ^s .161		12 ^h 48 ^m	33 ^s .111		13 ^h 28 ^m	9 ^s .628	
-84° 10'	46''.79		+88° 7'	36''.40		-84° 42'	20''.01		+83° 49'	52''.98		-85° 23'	33''.94	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Octantis. Mag. 4.1			Groombridge 2283. Mag. 7.2			ρ Octantis. Mag. 5.7			ϵ Ursæ Minoris. Mag. 4.4			59 G. Apodis. Mag. 5.9		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m 14 14	° ' -83 18	Dec.	h m 15 0	° ' +87 31	Dec.	h m 15 25	° ' -84 12	Dec.	h m 16 53	° ' +82 9	Dec.	h m 17 17	° ' -80 47
	s	"		s	"		s	"		s	"		s	"
0.9	25.53	56.90	0.9	53.54	34.00	0.9	18.21	41.05	1.0	32.19	64.38	1.0	2.77	26.34
1.9	25.66	56.67	1.9	53.71	33.66	1.9	18.29	40.77	2.0	32.16	64.01	2.0	2.76	26.05
2.9	25.78	56.43	2.9	53.86	33.33	2.9	18.38	40.48	3.0	32.13	63.67	3.0	2.75	25.73
3.9	25.92	56.19	3.9	54.00	33.01	3.9	18.49	40.18	4.0	32.11	63.34	4.0	2.75	25.41
4.9	26.09	55.96	4.9	54.13	32.69	4.9	18.62	39.88	4.9	32.08	63.01	5.0	2.75	25.08
5.9	26.26	55.75	5.9	54.24	32.37	5.9	18.76	39.59	5.9	32.04	62.67	6.0	2.79	24.74
6.9	26.43	55.56	6.9	54.35	32.03	6.9	18.93	39.32	6.9	32.01	62.34	7.0	2.83	24.41
7.9	26.61	55.40	7.9	54.48	31.66	7.9	19.10	39.07	7.9	31.97	61.98	8.0	2.87	24.10
8.9	26.80	55.25	8.9	54.61	31.30	8.9	19.25	38.83	8.9	31.94	61.62	9.0	2.92	23.81
9.9	26.97	55.10	9.9	54.79	30.93	9.9	19.41	38.63	9.9	31.92	61.24	10.0	2.97	23.53
10.9	27.14	54.97	10.9	55.00	30.56	10.9	19.56	38.42	10.9	31.91	60.82	10.9	3.01	23.26
11.9	27.29	54.83	11.9	55.24	30.19	11.9	19.69	38.20	11.9	31.90	60.42	11.9	3.04	23.00
12.9	27.44	54.68	12.9	55.50	29.85	12.9	19.82	37.97	12.9	31.91	60.03	12.9	3.08	22.73
13.9	27.59	54.52	13.9	55.78	29.53	13.9	19.95	37.74	13.9	31.92	59.66	13.9	3.11	22.45
14.9	27.75	54.35	14.9	56.05	29.22	14.9	20.08	37.51	14.9	31.93	59.29	14.9	3.13	22.16
15.9	27.90	54.17	15.9	56.34	28.93	15.9	20.22	37.26	15.9	31.94	58.94	15.9	3.16	21.86
16.9	28.08	54.00	16.9	56.61	28.65	16.9	20.37	37.01	16.9	31.96	58.60	16.9	3.19	21.55
17.9	28.26	53.83	17.9	56.87	28.37	17.9	20.54	36.76	17.9	31.97	58.25	17.9	3.23	21.24
18.9	28.45	53.68	18.9	57.12	28.09	18.9	20.71	36.52	18.9	31.98	57.92	18.9	3.28	20.92
19.8	28.64	53.54	19.9	57.37	27.81	19.9	20.89	36.28	19.9	32.00	57.59	19.9	3.33	20.60
20.8	28.84	53.41	20.9	57.62	27.52	20.9	21.07	36.05	20.9	32.02	57.26	20.9	3.39	20.29
21.8	29.04	53.31	21.9	57.89	27.23	21.9	21.27	35.85	21.9	32.03	56.90	21.9	3.47	19.98
22.8	29.24	53.21	22.9	58.16	26.92	22.9	21.47	35.65	22.9	32.05	56.54	22.9	3.55	19.70
23.8	29.44	53.14	23.9	58.46	26.61	23.9	21.67	35.48	23.9	32.07	56.17	23.9	3.64	19.43
24.8	29.63	53.08	24.9	58.78	26.30	24.9	21.87	35.32	24.9	32.10	55.80	24.9	3.72	19.18
25.8	29.82	53.01	25.9	59.12	25.99	25.9	22.06	35.17	25.9	32.13	55.41	25.9	3.80	18.93
26.8	30.01	52.95	26.9	59.49	25.69	26.9	22.24	35.02	26.9	32.18	55.03	26.9	3.86	18.70
27.8	30.19	52.87	27.9	59.88	25.41	27.9	22.42	34.85	27.9	32.23	54.65	27.9	3.92	18.46
28.8	30.36	52.79	28.9	60.29	25.14	28.9	22.59	34.68	28.9	32.29	54.28	28.9	3.98	18.20
29.8	30.54	52.70	29.9	60.68	24.90	29.9	22.76	34.50	29.9	32.35	53.94	29.9	4.04	17.93
30.8	30.73	52.60	30.9	61.06	24.67	30.9	22.94	34.32	30.9	32.41	53.62	30.9	4.12	17.65
31.8	30.93	52.53	31.8	61.43	24.46	31.9	23.16	34.14	31.9	32.46	53.30	31.9	4.20	17.36
8.59	-8.53		23.15	+23.13		9.91	-9.86		7.34	+7.27		6.25	-6.17	
14 ^h 14 ^m	23°.592		15 ^h 1 ^m	45°.970		15 ^h 25 ^m	17°.036		16 ^h 53 ^m	48°.037		17 ^h 17 ^m	1°.936	
~83° 19'	1''42		+87° 31'	46''68		-84° 12'	45''34		+82° 9'	58''64		-80° 47'	29''50	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

δ Ursæ Minoris. Mag. 4.4			χ Octantis. Mag. 5.2			λ Ursæ Minoris. Mag. 6.6			σ Octantis. Mag. 5.5			76 Draconis. Mag. 5.7		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '
	17 56	+86 36		18 9	-87 39		18 53	+89 1		19 36	-89 12		20 48	+82 15
	s	"		s	"		s	"		s	"		s	"
1.1	27.76	65.90	1.1	41.96	46.55	1.1	29.17	56.25	1.1	43.11	41.09	1.2	10.38	25.55
2.1	27.59	65.57	2.1	41.79	46.24	2.1	28.26	55.97	2.1	42.07	40.85	2.2	10.22	25.41
3.0	27.42	65.26	3.1	41.63	45.92	3.1	27.40	55.73	3.1	41.03	40.58	3.2	10.07	25.28
4.0	27.26	64.97	4.1	41.48	45.58	4.1	26.55	55.47	4.1	40.01	40.30	4.2	9.92	25.16
5.0	27.09	64.69	5.1	41.38	45.24	5.1	25.68	55.25	5.1	39.07	40.01	5.2	9.77	25.05
6.0	26.90	64.41	6.1	41.32	44.88	6.1	24.75	55.03	6.1	38.23	39.69	6.2	9.63	24.95
7.0	26.71	64.12	7.0	41.30	44.54	7.1	23.76	54.80	7.1	37.51	39.38	7.2	9.48	24.85
8.0	26.50	63.81	8.0	41.31	44.20	8.1	22.74	54.56	8.1	36.91	39.06	8.2	9.33	24.75
9.0	26.30	63.49	9.0	41.35	43.88	9.1	21.73	54.29	9.1	36.38	38.76	9.2	9.17	24.62
10.0	26.11	63.14	10.0	41.38	43.58	10.1	20.74	54.00	10.1	35.87	38.47	10.1	9.00	24.48
11.0	25.96	62.77	11.0	41.39	43.29	11.1	19.81	53.69	11.1	35.36	38.19	11.1	8.83	24.31
12.0	25.81	62.41	12.0	41.40	42.99	12.1	18.97	53.37	12.1	34.80	37.91	12.1	8.69	24.13
13.0	25.70	62.05	13.0	41.37	42.70	13.1	18.21	53.04	13.1	34.19	37.64	13.1	8.53	23.93
14.0	25.60	61.68	14.0	41.33	42.39	14.1	17.52	52.72	14.1	33.52	37.36	14.1	8.39	23.72
15.0	25.51	61.35	15.0	41.29	42.08	15.1	16.88	52.43	15.1	32.83	37.07	15.1	8.25	23.51
16.0	25.43	61.01	16.0	41.27	41.75	16.1	16.29	52.13	16.1	32.14	36.76	16.1	8.12	23.30
17.0	25.36	60.68	17.0	41.26	41.41	17.1	15.73	51.83	17.1	31.48	36.45	17.1	7.99	23.10
18.0	25.28	60.36	18.0	41.26	41.06	18.0	15.16	51.55	18.1	30.86	36.13	18.1	7.87	22.90
19.0	25.21	60.05	19.0	41.30	40.70	19.0	14.58	51.27	19.1	30.32	35.79	19.1	7.75	22.69
20.0	25.13	59.73	20.0	41.37	40.34	20.0	13.99	50.99	20.1	29.85	35.45	20.1	7.63	22.50
20.9	25.05	59.41	21.0	41.46	39.99	21.0	13.39	50.71	21.1	29.45	35.11	21.1	7.51	22.32
21.9	24.97	59.08	22.0	41.58	39.65	22.0	12.77	50.40	22.1	29.14	34.76	22.1	7.38	22.12
22.9	24.89	58.75	23.0	41.72	39.32	23.0	12.15	50.09	23.1	28.90	34.42	23.1	7.25	21.92
23.9	24.82	58.39	24.0	41.88	39.00	24.0	11.52	49.77	24.1	28.74	34.08	24.1	7.12	21.70
24.9	24.76	58.02	24.9	42.05	38.71	25.0	10.93	49.43	25.1	28.62	33.76	25.1	6.99	21.47
25.9	24.71	57.64	25.9	42.21	38.41	26.0	10.38	49.08	26.1	28.50	33.45	26.1	6.85	21.20
26.9	24.69	57.26	26.9	42.35	38.12	27.0	9.90	48.73	27.1	28.37	33.15	27.1	6.72	20.93
27.9	24.68	56.88	27.9	42.48	37.83	28.0	9.51	48.38	28.0	28.18	32.84	28.1	6.62	20.64
28.9	24.69	56.51	28.9	42.59	37.54	29.0	9.19	48.03	29.0	27.93	32.54	29.1	6.51	20.36
29.9	24.72	56.16	29.9	42.70	37.22	30.0	8.96	47.69	30.0	27.65	32.22	30.1	6.40	20.09
30.9	24.75	55.83	30.9	42.83	36.89	31.0	8.73	47.37	31.0	27.40	31.88	31.1	6.30	19.82
31.9	24.78	55.51	31.9	43.00	36.54	32.0	8.50	47.06	32.0	27.18	31.52	32.1	6.22	19.57
16.95	+16.92		24.51	-24.49		59.15	+59.14		72.56	-72.55		7.42	+7.35	
17 ^h 57 ^m	4° 32.6		18 ^h 9 ^m	46° 18.6		18 ^h 55 ^m	23° 39.3		19 ^h 37 ^m	1° 7.35		20 ^h 48 ^m	15° 38.5	
+86° 36'	50'' .43		-87° 39'	48'' .39		+89° 1'	32'' .83		-89° 12'	41'' .41		+82° 14'	50'' .67	

CIRCUMPOLAR STARS.

FOR THE UPPER TRANSIT AT WASHINGTON.

λ Octantis. Mag. 5.4			ν Octantis. Mag. 5.7			β Octantis. Mag. 4.3			39 H. Cephei. Mag. 5.6			γ^1 Octantis. Mag. 5.1		
Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.	Wash. Mean Time.	Right Ascen- sion.	Decli- nation.
Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '	Dec.	h m	° '
	21 39	-83 4		22 17	-86 21		22 38	-81 47		23 27	+86 53		23 47	-82 26
	s	"		s	"		s	"		s	"		s	"
1.2	16.64	30.39	1.2	20.55	40.72	1.2	17.55	11.94	1.3	57.94	34.41	1.3	39.21	51.61
2.2	16.47	30.31	2.2	20.23	40.68	2.2	17.41	11.95	2.3	57.53	34.51	2.3	39.07	51.70
3.2	16.29	30.21	3.2	19.89	40.63	3.2	17.26	11.94	3.3	57.15	34.61	3.3	38.89	51.79
4.2	16.12	30.09	4.2	19.52	40.55	4.2	17.10	11.90	4.3	56.78	34.71	4.3	38.72	51.85
5.2	15.95	29.95	5.2	19.16	40.45	5.2	16.94	11.85	5.3	56.43	34.83	5.3	38.54	51.91
6.2	15.80	29.77	6.2	18.83	40.32	6.2	16.79	11.77	6.3	56.08	34.96	6.3	38.36	51.93
7.2	15.64	29.59	7.2	18.50	40.18	7.2	16.65	11.67	7.3	55.72	35.10	7.3	38.21	51.93
8.2	15.51	29.40	8.2	18.20	40.03	8.2	16.52	11.56	8.3	55.34	35.26	8.3	38.05	51.92
9.2	15.38	29.20	9.2	17.91	39.88	9.2	16.39	11.44	9.3	54.93	35.41	9.3	37.90	51.90
10.2	15.27	29.02	10.2	17.64	39.73	10.2	16.27	11.33	10.3	54.50	35.52	10.3	37.77	51.88
11.2	15.15	28.87	11.2	17.37	39.59	11.2	16.16	11.23	11.3	54.06	35.62	11.3	37.63	51.87
12.2	15.03	28.72	12.2	17.11	39.47	12.2	16.03	11.15	12.3	53.61	35.69	12.3	37.48	51.87
13.2	14.90	28.56	13.2	16.83	39.36	13.2	15.91	11.07	13.2	53.16	35.74	13.3	37.34	51.87
14.2	14.76	28.41	14.2	16.54	39.25	14.2	15.78	10.99	14.2	52.74	35.79	14.3	37.19	51.88
15.2	14.62	28.24	15.2	16.22	39.12	15.2	15.65	10.91	15.2	52.32	35.82	15.3	37.02	51.89
16.2	14.47	28.07	16.2	15.90	38.99	16.2	15.51	10.82	16.2	51.91	35.83	16.3	36.85	51.91
17.2	14.32	27.89	17.2	15.58	38.85	17.2	15.37	10.72	17.2	51.53	35.86	17.3	36.69	51.91
18.2	14.17	27.69	18.2	15.27	38.68	18.2	15.22	10.60	18.2	51.15	35.90	18.2	36.52	51.88
19.2	14.02	27.47	19.2	14.96	38.51	19.2	15.07	10.46	19.2	50.77	35.93	19.2	36.35	51.85
20.2	13.89	27.25	20.2	14.65	38.33	20.2	14.93	10.31	20.2	50.39	35.96	20.2	36.18	51.80
21.2	13.76	27.01	21.2	14.36	38.11	21.2	14.80	10.16	21.2	50.01	36.00	21.2	36.02	51.72
22.2	13.65	26.76	22.2	14.09	37.89	22.2	14.68	9.98	22.2	49.62	36.04	22.2	35.85	51.64
23.1	13.54	26.50	23.2	13.83	37.66	23.2	14.57	9.80	23.2	49.21	36.07	23.2	35.70	51.55
24.1	13.44	26.25	24.2	13.59	37.46	24.2	14.46	9.61	24.2	48.79	36.08	24.2	35.56	51.45
25.1	13.35	26.01	25.2	13.36	37.25	25.2	14.35	9.42	25.2	48.34	36.10	25.2	35.42	51.34
26.1	13.26	25.78	26.2	13.14	37.04	26.2	14.25	9.24	26.2	47.89	36.10	26.2	35.29	51.24
27.1	13.17	25.56	27.2	12.93	36.83	27.2	14.14	9.08	27.2	47.44	36.07	27.2	35.16	51.16
28.1	13.08	25.34	28.2	12.70	36.64	28.2	14.04	8.93	28.2	47.00	36.03	28.2	35.01	51.08
29.1	12.97	25.11	29.2	12.45	36.44	29.2	13.93	8.76	29.2	46.57	35.97	29.2	34.86	50.99
30.1	12.86	24.88	30.2	12.18	36.24	30.2	13.80	8.59	30.2	46.18	35.91	30.2	34.71	50.91
31.1	12.75	24.62	31.2	11.91	36.01	31.2	13.68	8.41	31.2	45.79	35.84	31.2	34.56	50.82
32.1	12.64	24.35	32.2	11.64	35.78	32.2	13.55	8.20	32.2	45.42	35.78	32.2	34.38	50.72
8.29	-8.23		15.76	-15.72		7.00	-6.93		18.45	+18.42		7.61	-7.54	
21 ^h 39 ^m	16°.433		22 ^h 17 ^m	21°.969		22 ^h 38 ^m	16°.769		23 ^h 27 ^m	42°.388		23 ^h 47 ^m	38°.028	
-83° 4'	28''.91		-86° 21'	38''.42		-81° 47'	9''.68		+86° 52'	58''.09		-82° 26'	48''.40	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	33 Piscium. Mag. 4.7		α Andromedæ. (Alpheratz.) Mag. 2.2		β Cassiopeiæ. Mag. 2.4		ϵ Phœnicis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 1	° ' / — 6 7	h m 0 4	° ' / +28 39	h m 0 5	° ' / +58 43	h m 0 5	° ' / —46 9
	s " "	" "	s " "	" "	s " "	" "	s " "	" "
Jan. 0.2	23.330	82.05	24.288	63.06	4.200	46.31	29.373	96.99
10.2	23.214 ¹¹⁶	82.69 ⁶⁴	24.139 ¹⁴⁹	62.07 ⁹⁹	3.874 ³²⁶	45.49 ⁸²	29.168 ²⁰⁵	96.68 ³¹
20.2	23.106 ¹⁰⁸	83.22 ⁵³	23.995 ¹⁴⁴	60.84 ¹²³	3.562 ³¹²	44.19 ¹³⁰	28.977 ¹⁹¹	95.94 ⁷⁴
30.1	23.008 ⁹⁸	83.62 ⁴⁰	23.864 ¹³¹	59.37 ¹⁴⁷	3.273 ²⁸⁹	42.41 ¹⁷⁸	28.807 ¹⁷⁰	94.75 ¹¹⁹
Feb. 9.1	22.928 ⁸⁰	83.85 ²³	23.751 ¹¹³	57.78 ¹⁵⁹	3.023 ²⁵⁰	40.23 ²¹⁸	28.665 ¹⁴²	93.18 ¹⁶⁷
	60	8	90	189	204	249	110	196
19.1	22.868	83.93	23.661	56.09	2.819	37.74	28.555	91.22
Mar. 1.1	22.831	83.79	23.605	54.40 ¹⁶⁹	2.674 ¹⁴⁵	35.09 ²⁶⁵	28.483	88.94 ²²⁸
11.0	22.825 ⁶	83.46 ³³	23.584 ²¹	52.77 ¹⁶³	2.598 ⁷⁶	32.29 ²⁸⁰	28.452 ³¹	86.40 ²⁵⁴
21.0	22.853 ²⁸	82.88 ⁵⁸	23.606 ²²	51.31 ¹⁴⁶	2.598 ⁰	29.54 ²⁷⁵	28.469 ¹⁷	83.63 ²⁷⁷
31.0	22.918 ⁶⁵	82.07 ⁸¹	23.671 ⁶⁵	50.03 ¹²⁸	2.678 ⁸⁰	26.87 ²⁶⁷	28.534 ⁶⁵	80.71 ²⁹²
	105	105	113	100	158	237	117	304
Apr. 10.0	23.023	81.02	23.784	49.03	2.836	24.50	28.651	77.67
19.9	23.167 ¹⁴⁴	79.74 ¹²⁸	23.940 ¹⁵⁶	48.36 ⁶⁷	3.071 ²³⁵	22.42 ²⁰⁸	28.821 ¹⁷⁰	74.60 ³⁰⁷
29.9	23.348 ¹⁸¹	78.24 ¹⁵⁰	24.144 ²⁰⁴	48.07 ²⁹	3.378 ³⁰⁷	20.77 ¹⁶⁵	29.041 ²²⁰	71.56 ³⁰⁴
May 9.9	23.564 ²¹⁶	76.54 ¹⁷⁰	24.386 ²⁴²	48.17 ¹⁰	3.747 ³⁶⁹	19.57 ¹²⁰	29.305 ²⁸⁴	68.62 ²⁹⁴
19.8	23.813 ²⁴⁹	74.70 ¹⁸⁴	24.663 ²⁷⁷	48.66 ⁴⁹	4.168 ⁴²¹	18.86 ⁷¹	29.615 ³¹⁰	65.83 ²⁷⁹
	274	195	303	87	460	15	346	258
29.8	24.087	72.75	24.966	49.53	4.628	18.71	29.961	63.25
June 8.8	24.380 ²⁹³	70.74 ²⁰¹	25.289 ³²³	50.78 ¹²⁵	5.114 ⁴⁸⁶	19.07 ³⁶	30.334 ³⁷³	60.98 ²²⁷
18.8	24.684 ³⁰⁴	68.72 ²⁰²	25.623 ³³⁴	52.32 ¹⁵⁴	5.612 ⁴⁹⁸	19.95 ⁸⁸	30.725 ³⁹¹	59.04 ¹⁹⁴
28.7	24.993 ³⁰⁹	66.74 ¹⁹⁸	25.957 ³³⁴	54.16 ¹⁸⁴	6.109 ⁴⁹⁷	21.31 ¹³⁶	31.125 ⁴⁰⁰	57.49 ¹⁵⁵
July 8.7	25.296 ³⁰³	64.86 ¹⁸⁸	26.282 ³²⁵	56.22 ²⁰⁶	6.593 ⁴⁸⁴	23.13 ¹⁸²	31.522 ³⁹⁷	56.39 ¹¹⁰
	289	172	310	227	457	223	384	65
18.7	25.585	63.14	26.592	58.49	7.050	25.36	31.906	55.74 ¹⁷
28.7	25.852 ²⁶⁷	61.60 ¹⁵⁴	26.880 ²⁸⁸	60.88 ²³⁹	7.470 ⁴²⁰	27.95 ²⁵⁹	32.265 ³⁵⁹	55.57 ³¹
Aug. 7.6	26.093 ²¹¹	60.29 ¹³¹	27.136 ²⁵⁶	63.32 ²¹⁴	7.842 ³⁷²	30.83 ²⁸⁸	32.593 ³²⁸	55.88 ⁷⁸
17.6	26.301 ²⁰⁸	59.23 ¹⁰⁶	27.356 ²²⁰	65.77 ²⁴⁵	8.160 ³¹⁸	33.91 ³⁰⁸	32.877 ²⁸⁴	56.66 ¹²¹
27.6	26.472 ¹⁷¹	58.45 ⁷⁸	27.538 ¹⁸²	68.18 ²⁴¹	8.418 ²⁵⁸	37.17 ³²⁶	33.113 ²³⁶	57.87 ¹⁶⁰
	134	52	143	232	199	334	183	
Sept 6.5	26.606	57.93	27.681	70.50	8.617	40.51	33.296	59.47
16.5	26.701 ⁹⁵	57.70 ²³	27.783 ¹⁰²	72.68 ²¹⁸	8.750 ¹³³	43.87 ³³⁶	33.422 ¹²⁶	61.39 ¹⁹²
26.5	26.757 ⁵⁶	57.70 ⁰	27.842 ⁵⁹	74.72 ²⁰⁴	8.818 ⁶⁸	47.17 ³³⁰	33.490 ⁶⁸	63.55 ²¹⁶
Oct. 6.5	26.777 ²⁰	57.95 ²⁵	27.864 ²²	76.52 ¹⁸⁰	8.826 ⁸	50.36 ³¹⁹	33.502 ¹²	65.90 ²³⁵
16.4	26.764 ¹³	58.38 ⁴³	27.849 ¹⁵	78.10 ¹⁵⁸	8.774 ⁵²	53.34 ²⁹⁸	33.463 ³⁹	68.29 ²³⁹
	40	59	43	135	109	276	87	236
26.4	26.724	58.97	27.806	79.45	8.665	56.10	33.376	70.65
Nov. 5.4	26.658 ⁶⁶	59.70 ⁷³	27.732 ⁷⁴	80.48 ¹⁰³	8.504 ¹⁶¹	58.53 ²⁴³	33.247 ¹²⁹	72.88 ²²³
15.4	26.574 ⁸⁴	60.49 ⁷⁹	27.637 ⁹⁵	81.25 ⁷⁷	8.300 ²⁰⁴	60.60 ²⁰⁷	33.086 ¹⁶¹	74.88 ²⁰⁰
25.3	26.475 ⁹⁹	61.32 ⁸³	27.521 ¹¹⁶	81.69 ¹⁴⁴	8.053 ²⁴⁷	62.22 ¹⁶²	32.899 ¹⁸⁷	76.59 ¹⁷¹
Dec. 5.3	26.365 ¹¹⁰	62.16 ⁸⁴	27.388 ¹³³	81.84 ¹⁵	7.773 ²⁸⁰	63.37 ¹¹⁵	32.695 ²⁰⁴	77.92 ¹³³
	116	82	141	20	306	63	213	93
15.3	26.249	62.98	27.247	81.64	7.467	64.00	32.482	78.85
25.2	26.131 ¹¹⁸	63.75 ⁷⁷	27.099 ¹⁴⁸	81.15 ⁴⁹	7.146 ³²¹	64.09 ⁹	32.268 ²¹⁴	79.32 ⁴⁷
35.2	26.015 ¹¹⁶	64.43 ⁶⁸	26.949 ¹⁵⁰	80.34 ⁸¹	6.819 ³²⁷	63.66 ⁴³	32.058 ²¹⁰	79.32 ⁰
Mean Place	23.683	77.95	24.224	55.26	3.554	30.44	30.388	80.64
Sec δ , Tan δ	1.006	−0.108	1.140	+0.547	1.927	+1.647	1.444	−1.042
$D\psi\alpha$, $D\omega\alpha$	+0.061	+0.007	+0.061	−0.036	+0.062	−0.110	+0.061	+0.069
$D\psi\delta$, $D\omega\delta$	+0.40	+0.01	+0.40	+0.02	+0.40	+0.02	+0.40	+0.02

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	22 Andromedæ. Mag. 5.1		γ Pegasi. Mag. 2.9		σ Andromedæ. Mag. 4.5		ι Ceti. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 6	° ' " +45 38	h m 0 9	° ' " +14 45	h m 0 14	° ' " +36 21	h m 0 15	° ' " - 9 14
	s	"	s	"	s	"	s	"
Jan. 0.2	19.128	50.39	16.043	22.89	18.265	39.90	29.992	68.15
10.2	18.913 ²¹⁵	49.48 ⁹¹	15.918 ¹²⁵	22.00 ⁸⁹	18.091 ¹⁷⁴	39.01 ⁸⁹	29.870 ¹²²	68.76 ⁶¹
20.2	18.705 ²⁰⁸	48.15 ¹³³	15.797 ¹²¹	20.98 ¹⁰²	17.921 ¹⁷⁰	37.79 ¹²²	29.755 ¹¹⁵	69.24 ⁴⁸
30.2	18.512 ¹⁹³	46.46 ¹⁶⁹	15.684 ¹¹³	19.90 ¹⁰⁸	17.764 ¹⁵⁷	36.28 ¹⁵¹	29.648 ¹⁰⁷	69.55 ³¹
Feb. 9.1	18.345 ¹⁶⁷	44.47 ¹⁹⁹	15.588 ⁹⁶	18.79 ¹¹¹	17.623 ¹⁴¹	34.54 ¹⁷⁴	29.555 ⁹³	69.66 ¹¹
	185	221	75	108	114	189	73	8
19.1	18.210	42.26	15.513	17.71	17.509	32.65	29.482	69.58
Mar. 1.1	18.117 ⁹³	39.92 ²³⁴	15.463 ⁵⁰	16.70 ¹⁰¹	17.429 ⁸⁰	30.68 ¹⁹⁷	29.430 ⁵²	69.27 ³¹
11.0	18.072 ⁴⁵	37.56 ²³⁶	15.445 ¹⁸	15.81 ⁸⁹	17.389 ⁴⁰	28.72 ¹⁹⁶	29.413 ¹⁷	68.74 ⁵³
21.0	18.081 ⁹	35.27 ²²⁹	15.463 ¹⁸	15.11 ⁷⁰	17.394 ⁵	26.86 ¹⁸⁶	29.425 ¹²	68.01 ⁷³
31.0	18.148 ⁶⁷	33.16 ²¹¹	15.521 ⁵⁸	14.64 ⁴⁷	17.449 ⁵⁵	25.19 ¹⁶⁷	29.478 ⁵³	66.99 ¹⁰²
	126	187	102	18	106	113	89	125
Apr. 10.0	18.274	31.29	15.623	14.46	17.555	23.76	29.567	65.74
19.9	18.459 ¹⁸⁵	29.78 ¹⁵¹	15.763 ¹⁴⁰	14.56 ¹⁰	17.712 ¹⁵⁷	22.67 ¹⁰⁹	29.699 ¹³²	64.31 ¹⁴³
29.9	18.698 ²³⁹	28.66 ¹¹²	15.946 ¹⁸³	15.00 ⁴⁴	17.919 ²⁰⁷	21.95 ⁷²	29.868 ¹⁶⁹	62.65 ¹⁶⁶
May 9.9	18.987 ²⁸⁹	27.98 ⁶⁸	16.167 ²²¹	15.71 ⁷¹	18.170 ²⁵¹	21.63 ³²	30.076 ²⁰⁸	60.83 ¹⁸²
19.8	19.316 ³²⁹	27.77 ²¹	16.420 ²⁵³	16.77 ¹⁰⁶	18.459 ²⁸⁹	21.74 ¹¹	30.316 ²⁴⁰	58.87 ¹⁹⁶
	362	28	279	132	320	54	267	204
29.8	19.678	28.05	16.699	18.09	18.779	22.28	30.583	56.83
June 8.8	20.060 ³⁸²	28.79 ⁷⁴	16.998 ²⁹⁹	19.65 ¹⁵⁶	19.121 ³⁴²	23.21 ⁹³	30.874 ²⁹¹	54.75 ²⁰⁸
18.8	20.454 ³⁹⁴	29.98 ¹¹⁹	17.308 ³¹⁰	21.44 ¹⁷⁹	19.475 ³⁵⁴	24.54 ¹³³	31.177 ³⁰³	52.69 ²⁰⁶
28.7	20.848 ³⁹¹	31.59 ¹⁶¹	17.621 ³¹³	23.38 ¹⁹⁴	19.831 ³⁵⁶	26.23 ¹⁶⁹	31.484 ³⁰⁷	50.71 ¹⁹⁸
July 8.7	21.232 ³⁸¹	33.57 ¹⁹⁸	17.928 ³⁰⁷	25.43 ²⁰⁵	20.179 ³⁴⁸	28.22 ¹⁹⁹	31.790 ³⁰⁶	48.85 ¹⁸⁶
	363	229	292	210	333	223	293	168
18.7	21.595	35.86	18.220	27.53	20.512	30.45	32.083	47.17
28.7	21.931 ³³⁶	38.42 ²⁵⁶	18.492 ²⁷²	29.63 ²¹⁰	20.821 ³⁰⁹	32.87 ²⁴²	32.358 ²⁷⁵	45.71 ¹⁴⁶
Aug. 7.6	22.229 ²⁹⁸	41.17 ²⁷⁵	18.740 ²⁴⁸	31.68 ²⁰⁵	21.100 ²⁷⁹	35.41 ²⁵⁷	32.611 ²⁵³	44.48 ¹²³
17.6	22.486 ²⁵⁷	44.06 ²⁸⁹	18.954 ²¹⁴	33.64 ¹⁹⁶	21.341 ²⁴¹	38.07 ²⁶³	32.830 ²¹⁹	43.53 ⁹⁵
27.6	22.696 ²¹⁰	47.02 ²⁹⁶	19.130 ¹⁷⁶	35.46 ¹⁸²	21.542 ²⁰¹	40.73 ²⁶⁶	33.015 ¹⁸⁵	42.90 ⁶³
	162	298	142	164	159	261	148	38
Sept. 6.5	22.858	50.00	19.272	37.10	21.701	43.34	33.163	42.52
16.5	22.971 ¹¹³	52.94 ²⁹⁴	19.373 ¹⁰¹	38.56 ¹⁴⁶	21.817 ¹¹⁶	45.87 ²⁵³	33.273 ¹¹⁰	42.47 ⁵
26.5	23.036 ⁶⁵	55.76 ²⁸²	19.437 ⁶⁴	39.82 ¹²⁶	21.890 ⁷³	48.28 ²⁴¹	33.346 ⁷³	42.66 ¹⁹
Oct. 6.5	23.054 ¹⁸	58.42 ²⁶⁶	19.469 ³²	40.83 ¹⁰¹	21.922 ³²	50.50 ²²²	33.381 ³⁵	43.09 ⁴³
16.4	23.027 ⁶⁷	60.88 ²⁴⁶	19.463 ⁶	41.62 ⁷⁹	21.915 ⁷	52.52 ²⁰²	33.381 ⁰	43.73 ⁶⁴
	27	220	32	57	41	176	26	78
26.4	22.960	63.08	19.431	42.19	21.874	54.28	33.355	44.51
Nov. 5.4	22.857 ¹⁰³	64.97 ¹⁸⁹	19.372 ⁵⁹	42.53 ³⁴	21.801 ⁷³	55.76 ¹⁴⁸	33.298 ⁵⁷	45.39 ⁸⁸
15.4	22.723 ¹³⁴	66.52 ¹⁵⁵	19.293 ⁷⁹	42.64 ¹¹	21.701 ¹⁰⁰	56.92 ¹¹⁶	33.221 ⁷⁷	46.31 ⁹²
25.3	22.561 ¹⁶²	67.66 ¹¹⁴	19.197 ⁹⁶	42.57 ⁷	21.577 ¹²⁴	57.75 ⁸³	33.129 ⁹²	47.28 ⁹⁷
Dec. 5.3	22.377 ¹⁸⁴	68.38 ⁷²	19.086 ¹¹¹	42.28 ²⁹	21.434 ¹⁴³	58.22 ⁴⁷	33.022 ¹⁰⁷	48.24 ⁹⁶
	201	28	118	49	159	9	116	89
15.3	22.176	68.66	18.968	41.79	21.275	58.31	32.906	49.13
25.2	21.965 ²¹¹	68.49 ¹⁷	18.842 ¹²⁶	41.15 ⁶⁴	21.106 ¹⁶⁹	58.02 ²⁹	32.786 ¹²⁰	49.93 ⁸⁰
35.2	21.747 ²¹⁸	67.87 ⁶²	18.716 ¹²⁶	40.34 ⁸¹	20.935 ¹⁷¹	57.37 ⁶⁵	32.665 ¹²¹	50.64 ⁷¹
Mean Place	18.788	37.65	16.115	19.97	18.024	30.09	30.299	62.35
Sec δ, Tan δ	1.430	+1.023	1.034	+0.263	1.242	+0.736	1.013	-0.163
Dψα, Dωα	+0.062	-0.068	+0.061	-0.018	+0.062	-0.049	+0.061	+0.011
Dψδ, Dωδ	+0.40	+0.03	+0.40	+0.04	+0.40	+0.06	+0.40	+0.07

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Tucanæ. Mag. 4.3		44 Piscium. Mag. 6.0		β Hydri. Mag. 2.9		α Phœnicis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 16	° ' " -65 19	h m 0 21	° ' " + 1 30	h m 0 21	° ' " -77 40	h m 0 22	° ' " -42 43
	s "	"	s "	"	s "	"	s "	"
Jan. 0.2	2.58	57.23	27.136	45.53	40.37	98.12	28.162	43.26
10.2	2.18 40	56.49 74	27.016 120	44.78 75	39.47 90	97.16 96	27.966 196	43.23 3
20.2	1.80 38	55.22 127	26.900 116	44.07 71	38.63 81	95.63 153	27.780 186	42.75 48
30.2	1.46 34	53.41 181	26.791 109	43.41 66	37.87 76	93.54 209	27.611 169	41.85 90
Feb. 9.1	1.16 30	51.13 228	26.695 96	42.84 57	37.20 67	90.99 255	27.462 149	40.53 132
	24	289	78	45	54	299	121	171
19.1	0.92	48.44	26.617	42.39	36.66	88.00	27.341	38.82
Mar. 1.1	0.75 17	45.41 303	26.561 56	42.10 29	36.25 41	84.72 328	27.253 88	36.79 203
11.0	0.65 10	42.13 328	26.536 25	41.98 12	35.98 27	81.16 356	27.203 50	34.45 234
21.0	0.63 2	38.66 347	26.543 7	42.08 10	35.87 11	77.46 370	27.196 7	31.88 257
31.0	0.68 5	35.06 360	26.587 44	42.43 35	35.90 3	73.67 379	27.236 40	29.10 278
	14	363	85	59	20	379	89	292
Apr. 10.0	0.82	31.43	26.672	43.02	36.10	69.88	27.325	26.18
19.9	1.04 22	27.84 359	26.798 126	43.86 84	36.45 35	66.19 369	27.465 140	23.18 300
29.9	1.34 30	24.38 316	26.964 166	44.97 111	36.95 50	62.65 354	27.654 189	20.16 302
May 9.9	1.71 37	21.09 329	27.167 203	46.30 133	37.59 64	59.38 327	27.890 236	17.20 296
19.9	2.16 45	18.09 300	27.404 237	47.86 156	38.35 76	56.43 295	28.171 281	14.36 284
	50	268	266	172	88	259	317	268
29.8	2.66	15.41	27.670	49.58	39.23	53.84	28.488	11.68
June 8.8	3.20 54	13.14 227	27.956 286	51.45 187	40.20 97	51.70 211	28.835 347	9.27 241
18.8	3.79 59	11.31 183	28.255 299	53.40 195	41.24 104	50.03 167	29.202 367	7.15 212
28.7	4.39 60	9.96 135	28.562 307	55.38 198	42.32 108	48.94 109	29.582 380	5.40 175
July 8.7	4.99 60	9.17 79	28.864 302	57.35 197	43.41 109	48.40 54	29.963 381	4.05 135
	59	26	293	190	108	2	370	90
18.7	5.58	8.91	29.157	59.25	44.49	48.42	30.333	3.15
28.7	6.14 56	9.22 31	29.431 274	61.03 178	45.52 103	49.01 59	30.685 352	2.72 43
Aug. 7.6	6.66 52	10.05 83	29.680 249	62.63 160	46.47 95	50.16 115	31.008 323	2.77 5
17.6	7.12 46	11.41 136	29.902 222	64.05 142	47.32 85	51.82 166	31.295 287	3.29 52
27.6	7.50 38	13.26 185	30.087 185	65.23 118	48.04 72	53.97 215	31.537 242	4.24 95
	30	222	150	95	56	254	196	137
Sept. 6.6	7.80	15.48	30.237	66.18	48.60	56.51	31.733	5.61
16.5	8.00 20	18.05 257	30.350 113	66.88 70	48.99 39	59.33 282	31.875 112	7.34 173
26.5	8.12 12	20.82 277	30.426 76	67.32 44	49.19 20	62.39 306	31.965 90	9.34 200
Oct. 6.5	8.14 2	23.72 290	30.467 41	67.53 21	49.21 2	65.51 312	32.000 35	11.55 221
16.4	8.06 8	26.63 291	30.476 9	67.53 0	49.04 17	68.60 309	31.987 13	13.87 232
	16	281	21	20	35	293	58	234
26.4	7.90	29.44	30.455	67.33	48.69	71.53	31.929	16.21
Nov. 5.4	7.66 24	32.01 257	30.410 45	66.98 85	48.19 50	74.24 271	31.830 99	18.46 225
15.4	7.36 30	34.26 225	30.342 68	66.49 49	47.54 65	76.53 229	31.698 132	20.54 208
25.3	7.01 35	36.08 182	30.257 85	65.90 59	46.77 77	78.33 180	31.540 158	22.36 182
Dec. 5.3	6.62 133	37.41 133	30.159 98	65.22 68	45.92 85	79.60 127	31.363 177	23.86 150
	42	80	109	72	90	89	193	113
15.3	6.20	38.21	30.050	64.50	45.02	80.29	31.170	24.99
25.3	5.78 42	38.43 22	29.934 116	63.75 75	44.10 92	80.34 5	30.974 196	25.67 68
35.2	5.37 41	38.04 39	29.817 117	63.00 75	43.20 90	79.75 59	30.777 197	25.93 26
Mean Place	4.349	36.93	27.283	47.80	43.780	76.44	28.945	26.92
Sec δ, Tan δ	2.396	-2.177	1.000	+0.026	4.690	-4.582	1.361	-0.924
Dψα, Dωα	+0.057	+0.145	+0.061	-0.002	+0.050	+0.304	+0.059	+0.061
Dψδ, Dωδ	+0.40	+0.07	+0.40	+0.09	+0.40	+0.09	+0.40	+0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 Ceti. Mag. 6.0		13 Ceti. Mag. 5.2		ζ Cassiopeiæ. Mag. 3.7		π Andromedæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 26	° ' " - 4 22	h m 0 31	° ' " - 4 0	h m 0 32	° ' " +53 28	h m 0 32	° ' " +33 17
	s	"	s	"	s	"	s	"
Jan. 0.2	6.382	61.71	16.888	63.93	41.135	37.75	46.134	52.68
10.2	6.261 ¹²¹	62.40 ⁶⁹	16.767 ¹²¹	64.62 ⁶⁹	40.862 ²⁷³	37.23 ⁵²	45.968 ¹⁶⁶	51.90 ⁷⁸
20.2	6.144 ¹¹⁷	63.00 ⁶⁰	16.649 ¹¹⁸	65.23 ⁶¹	40.589 ²⁷³	36.22 ¹⁰¹	45.801 ¹⁶⁷	50.86 ¹⁰⁴
30.2	6.034 ¹¹⁰	63.49 ⁴⁹	16.535 ¹¹⁴	65.72 ⁴⁹	40.329 ²⁶⁰	34.75 ¹¹⁷	45.641 ¹⁶⁰	49.53 ¹³³
Feb. 9.1	5.934 ¹⁰⁰	63.81 ³²	16.434 ¹⁰¹	66.05 ³³	40.093 ²³⁶	32.89 ¹⁸⁶	45.498 ¹⁴³	47.98 ¹⁵⁵
	80	15	85	18	202	216	122	169
19.1	5.854 ⁵⁹	63.96 ³	16.349 ⁶²	66.23 ⁰	39.891 ¹⁵⁸	30.73 ²⁴⁰	45.376 ⁹⁵	46.29 ¹⁷⁵
Mar. 1.1	5.795 ³¹	63.93 ²¹	16.287 ³⁴	66.23 ²²	39.733 ¹⁰¹	28.33 ²⁵¹	45.281 ⁵⁶	44.54 ¹⁷⁷
11.1	5.764 ³	63.69 ⁴⁷	16.253 ³	66.01 ⁴³	39.632 ³⁹	25.82 ²⁵⁴	45.225 ¹³	42.77 ¹⁶⁷
21.0	5.767 ⁴¹	63.22 ⁶⁸	16.250 ³⁵	65.58 ⁶⁸	39.593 ²⁹	23.28 ²¹⁴	45.212 ³³	41.10 ¹⁵¹
31.0	5.808 ⁷⁸	62.54 ⁹⁶	16.285 ⁷⁶	64.90 ⁹¹	39.622 ⁹⁹	20.84 ²²⁵	45.245 ⁸⁴	39.59 ¹³⁰
Apr. 10.0	5.886 ¹²¹	61.58 ¹¹⁹	16.361 ¹¹⁶	63.99 ¹¹⁷	39.721 ¹⁷¹	18.59 ¹⁹⁸	45.329 ¹³¹	38.29 ⁹⁸
19.9	6.007 ¹⁶⁰	60.39 ¹⁴¹	16.477 ¹⁵⁷	62.82 ¹³⁸	39.892 ²³⁷	16.61 ¹⁸²	45.460 ¹⁸⁴	37.31 ⁶⁶
29.9	6.167 ¹⁹⁸	58.98 ¹⁵⁹	16.634 ¹⁹⁵	61.44 ¹⁶⁰	40.129 ²³⁸	14.99 ¹¹⁸	45.644 ²²⁹	36.65 ²⁷
May 9.9	6.365 ²³⁵	57.39 ¹⁷⁹	16.829 ²³⁰	59.84 ¹⁷⁶	40.427 ³⁵⁰	13.81 ⁷⁶	45.873 ²⁶⁶	36.38 ¹¹
19.9	6.600 ²⁶¹	55.60 ¹⁹¹	17.059 ²⁶⁰	58.08 ¹⁸⁹	40.777 ³⁹⁴	13.05 ²⁷	46.139 ³⁰²	36.49 ⁵⁵
29.8	6.861 ²⁸³	53.69 ¹⁹⁸	17.319 ²⁸³	56.19 ¹⁹⁹	41.171 ⁴²⁵	12.78 ²³	46.441 ³²⁶	37.04 ⁸⁹
June 8.8	7.144 ³⁰⁰	51.71 ²⁰³	17.602 ²⁹⁸	54.20 ²⁰²	41.596 ⁴⁴¹	13.01 ⁷¹	46.767 ³⁴¹	37.93 ¹²³
18.8	7.444 ³⁰⁶	49.68 ²⁰¹	17.900 ³⁰⁷	52.18 ²⁰¹	42.040 ⁴¹⁹	13.72 ¹¹⁹	47.108 ³⁴⁹	39.16 ¹⁶⁰
28.8	7.750 ³⁰³	47.67 ¹⁹³	18.207 ³⁰⁷	50.17 ¹⁹⁴	42.489 ⁴⁴⁵	14.91 ¹⁶¹	47.457 ³⁴¹	40.76 ¹⁸⁵
July 8.7	8.053 ²⁹⁴	45.74 ¹⁷⁹	18.514 ²⁹³	48.23 ¹⁸²	42.934 ⁴³¹	16.52 ¹⁹⁹	47.801 ³³²	42.61 ²¹¹
18.7	8.347 ²⁷⁷	43.95 ¹⁶²	18.807 ²⁸¹	46.41 ¹⁶¹	43.365 ⁴⁰⁰	18.51 ²³⁴	48.133 ³¹¹	44.72 ²²⁸
28.7	8.624 ²⁵⁶	42.33 ¹¹²	19.088 ²⁵⁷	44.77 ¹⁴¹	43.765 ³⁶⁷	20.85 ²⁶²	48.447 ²⁸⁷	47.00 ²³⁹
Aug. 7.6	8.880 ²²³	40.91 ¹¹⁹	19.345 ²²⁹	43.33 ¹¹⁸	44.132 ³²⁵	23.47 ²⁸¹	48.734 ²⁵⁵	49.39 ²⁴⁷
17.6	9.103 ¹⁹¹	39.72 ⁹¹	19.574 ¹⁹⁶	42.15 ⁹⁴	44.457 ²⁷⁵	26.31 ³⁰⁰	48.989 ²¹⁶	51.86 ²⁴⁹
27.6	9.294 ¹⁵⁸	38.81 ⁶²	19.770 ¹⁶¹	41.21 ⁶⁵	44.732 ²²²	29.31 ³¹⁰	49.205 ¹⁷⁸	54.35 ²⁴⁴
Sept. 6.6	9.452 ¹¹⁷	38.19 ³⁶	19.931 ¹²³	40.56 ³⁸	44.954 ¹⁷⁰	32.41 ³¹³	49.383 ¹³⁸	56.79 ²³⁶
16.5	9.569 ⁸³	37.83 ¹⁰	20.054 ⁸⁸	40.18 ¹²	45.124 ¹¹⁵	35.54 ³⁰⁹	49.521 ⁹⁵	59.15 ²²⁶
26.5	9.652 ⁴³	37.73 ¹⁶	20.142 ⁵¹	40.06 ¹³	45.239 ⁶¹	38.63 ³⁰⁰	49.616 ⁵⁶	61.41 ²⁰⁸
Oct. 6.5	9.695 ¹³	37.89 ³³	20.193 ¹⁸	40.19 ³³	45.300 ⁸	41.63 ²⁸⁶	49.672 ¹⁹	63.49 ¹⁸⁶
16.5	9.708 ¹⁵	38.22 ⁵⁴	20.211 ¹²	40.52 ⁵²	45.308 ⁴⁰	44.49 ²⁶⁴	49.691 ¹⁷	65.35 ¹⁶⁴
26.4	9.693 ⁴¹	38.76 ⁶⁶	20.199 ³⁸	41.04 ⁶⁶	45.268 ⁸⁹	47.13 ²³⁸	49.674 ⁴⁶	66.99 ¹⁴⁰
Nov. 5.4	9.649 ⁶⁷	39.42 ⁷⁸	20.161 ⁶²	41.70 ⁷⁵	45.179 ¹³³	49.51 ²⁰⁴	49.628 ⁷⁶	68.39 ¹¹⁰
15.4	9.582 ⁸³	40.20 ⁸²	20.099 ⁷⁹	42.45 ⁸²	45.046 ¹⁷⁰	51.55 ¹⁶⁷	49.552 ¹⁰¹	69.49 ⁷⁹
25.3	9.499 ⁹⁹	41.02 ⁸⁵	20.020 ⁹⁴	43.27 ⁸⁵	44.876 ²⁰⁴	53.22 ¹²⁵	49.451 ¹²⁰	70.28 ⁴⁸
Dec. 5.3	9.400 ¹⁰⁹	41.87 ⁸³	19.926 ¹⁰⁷	44.12 ⁸³	44.672 ²³³	54.47 ⁷⁸	49.328 ¹⁴⁰	70.76 ¹²
15.3	9.291 ¹¹⁷	42.70 ⁸⁰	19.819 ¹¹³	44.95 ⁸⁰	44.439 ²⁵⁶	55.25 ³⁰	49.188 ¹⁵³	70.88 ¹⁹
25.3	9.174 ¹¹⁹	43.50 ⁷³	19.706 ¹¹⁶	45.75 ⁷³	44.183 ²⁷²	55.55 ²¹	49.035 ¹⁶³	70.69 ⁵⁶
35.2	9.055	44.23	19.590	46.48	43.911	55.34	48.872	70.13
Mean Place	6.569	57.15	17.039	59.28	40.378	24.09	45.813	44.52
Sec δ, Tan δ	1.003	-0.077	1.002	-0.070	1.680	+1.350	1.196	+0.657
Dψα, Dωα	+0.061	+0.005	+0.061	+0.005	+0.066	-0.089	+0.064	-0.043
Dψδ, Dωδ	+0.40	+0.11	+0.39	+0.14	+0.39	+0.14	+0.39	+0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Andromedæ. Mag. 4.5		δ Andromedæ. Mag. 3.5		α Cassiopeiæ. (Schedir.) Var. 2.2-2.8		μ Phœnicis. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 34	° ' " +28 53	h m 0 35	° ' " +30 26	h m 0 36	° ' " +56 6	h m 0 37	° ' " -46 30
	s	"	s	"	s	"	s	"
Jan. 0.2	29.212	44.61	12.660	30.00	8.488	69.13	40.580	46.57
10.2	29.057 ¹⁵⁵	43.85 ⁷⁶	12.503 ¹⁵⁷	29.23 ⁷⁷	8.190 ²⁹⁸	68.69 ⁴⁴	40.357 ²²³	46.61 ⁴
20.2	28.904 ¹⁵³	42.82 ¹⁰³	12.344 ¹⁵⁹	28.21 ¹⁰²	7.892 ²⁹⁸	67.74 ⁹⁵	40.143 ²¹⁴	46.16 ⁴⁵
30.2	28.756 ¹⁴⁸	41.56 ¹²⁶	12.194 ¹⁵⁰	26.95 ¹²⁶	7.604 ²⁸⁸	66.29 ¹⁴⁵	39.942 ²⁰¹	45.23 ⁹³
Feb. 9.1	28.620 ¹³⁶	40.14 ¹⁴²	12.055 ¹³⁹	25.50 ¹⁴⁵	7.343 ²⁶¹	64.46 ¹⁸³	39.761 ¹⁸¹	43.87 ¹³⁶
	115	154	118	159	224	218	151	177
19.1	28.505 ⁸⁹	38.60 ¹⁵⁹	11.937 ⁹¹	23.91 ¹⁶⁴	7.119 ¹⁷⁵	62.28 ²⁴¹	39.610 ¹¹⁹	42.10 ²¹⁵
Mar. 1.1	28.416 ⁵⁴	37.01 ¹⁵⁷	11.846 ⁵⁶	22.27 ¹⁶³	6.944 ¹¹⁷	59.87 ²⁵⁷	39.491 ⁸⁰	39.95 ²⁴⁶
11.1	28.362 ¹⁴	35.44 ¹⁴⁷	11.790 ¹³	20.64 ¹⁵⁴	6.827 ⁵⁰	57.30 ²⁶⁰	39.411 ³⁵	37.49 ²⁷²
21.0	28.348 ³¹	33.97 ¹²⁹	11.777 ³¹	19.10 ¹³⁶	6.777 ²²	54.70 ²⁵⁶	39.376 ¹⁵	34.77 ²⁹³
31.0	28.379 ⁷⁹	32.68 ¹⁰⁵	11.808 ⁷⁹	17.74 ¹¹³	6.799 ⁹⁷	52.14 ²³⁵	39.391 ⁶⁶	31.84 ³⁰⁹
Apr. 10.0	28.458 ¹²⁷	31.63 ⁷⁶	11.887 ¹²⁸	16.61 ⁸⁶	6.896 ¹⁷⁴	49.79 ²¹⁰	39.457 ¹²⁰	28.75 ³¹⁶
19.9	28.585 ¹⁷⁴	30.87 ⁴⁴	12.015 ¹⁷⁵	15.75 ⁵¹	7.070 ²⁴⁵	47.69 ¹⁷⁵	39.577 ¹⁷⁵	25.59 ³¹⁸
29.9	28.759 ²¹⁹	30.43 ⁶	12.190 ²²³	15.24 ¹⁵	7.315 ³⁰⁸	45.94 ¹³⁵	39.752 ¹³⁵	22.41 ³¹³
May 9.9	28.978 ²⁵⁷	30.37 ³⁰	12.413 ²⁶⁰	15.09 ²³	7.623 ³⁶⁶	44.59 ⁸⁷	39.978 ²⁷⁴	19.28 ³⁰⁰
19.9	29.235 ²⁸⁹	30.67 ⁶⁸	12.673 ²⁹³	15.32 ⁶²	7.989 ⁴¹¹	43.72 ⁴²	40.252 ³¹⁷	16.28 ²⁸²
29.8	29.524 ³¹⁴	31.35 ¹⁰³	12.966 ³¹⁷	15.94 ⁹⁷	8.400 ⁴⁴⁷	43.30 ¹⁰	40.569 ³⁵¹	13.46 ²⁵⁵
June 8.8	29.838 ³²⁹	32.38 ¹³⁵	13.283 ³³³	16.91 ¹³⁰	8.847 ⁴⁶⁷	43.40 ⁵⁹	40.920 ³⁷⁶	10.91 ²²³
18.8	30.167 ³³⁵	33.73 ¹⁶⁵	13.616 ³⁴²	18.21 ¹⁶²	9.314 ⁴⁷⁵	43.99 ¹¹⁰	41.296 ³⁹³	8.68 ¹⁸⁶
28.8	30.502 ³³³	35.38 ¹⁸⁸	13.958 ³³⁷	19.83 ¹⁸⁷	9.789 ⁴⁷⁰	45.09 ¹⁵²	41.689 ³⁹⁷	6.82 ¹⁴²
July 8.7	30.835 ³²³	37.26 ²⁰⁹	14.295 ³²⁶	21.70 ²⁰⁸	10.259 ⁴⁵³	46.61 ¹⁹²	42.086 ³⁹²	5.40 ⁹⁶
18.7	31.158 ³⁰³	39.35 ²²²	14.621 ³⁰⁸	23.78 ²²⁴	10.712 ⁴²⁷	48.53 ²²⁸	42.478 ³⁷⁶	4.44 ⁴⁷
28.7	31.461 ²⁷⁸	41.57 ²³⁰	14.929 ²⁸³	26.02 ²³³	11.139 ³⁸⁹	50.81 ²⁶¹	42.854 ³⁴⁹	3.97 ⁴
Aug. 7.6	31.739 ²⁴⁶	43.87 ²³⁴	15.212 ²⁵¹	28.35 ²³⁹	11.528 ³⁴⁶	53.42 ²⁸²	43.203 ³¹⁴	4.01 ⁵³
17.6	31.985 ²¹¹	46.21 ²³²	15.463 ²¹⁴	30.74 ²³⁷	11.874 ²⁹⁵	56.24 ³⁰³	43.517 ²⁷⁰	4.54 ¹⁰¹
27.6	32.196 ¹⁷³	48.53 ²²⁵	15.677 ¹⁷⁷	33.11 ²³²	12.169 ²⁴⁰	59.27 ³¹⁴	43.787 ²²¹	5.55 ¹⁴⁵
Sept. 6.6	32.369 ¹³⁴	50.78 ²¹⁴	15.854 ¹³⁷	35.43 ²²²	12.409 ¹⁸⁷	62.41 ³¹⁹	44.008 ¹⁶⁸	7.00 ¹⁸²
16.5	32.503 ⁹⁵	52.92 ²⁰¹	15.991 ⁹⁸	37.65 ²⁰⁸	12.596 ¹²⁷	65.60 ³¹⁹	44.176 ¹¹²	8.82 ²¹³
26.5	32.598 ⁵⁷	54.93 ¹⁸²	16.089 ⁶⁰	39.73 ¹⁹³	12.723 ⁶⁷	68.79 ³¹⁰	44.288 ⁵⁵	10.95 ²³⁵
Oct. 6.5	32.655 ²¹	56.75 ¹⁶²	16.149 ²²	41.66 ¹⁷⁰	12.790 ¹²	71.89 ²⁹⁶	44.343 ²	13.30 ²⁴⁹
16.5	32.676 ¹³	58.37 ¹³⁹	16.171 ¹²	43.36 ¹⁴⁹	12.802 ⁴²	74.85 ²⁷⁹	44.345 ⁴⁸	15.79 ²⁵¹
26.4	32.663 ⁴¹	59.76 ¹¹⁴	16.159 ⁴¹	44.85 ¹²⁵	12.760 ⁹¹	77.64 ²⁵⁰	44.297 ⁹³	18.30 ²⁴³
Nov. 5.4	32.622 ⁶⁹	60.90 ⁸⁹	16.118 ⁷⁰	46.10 ⁹⁷	12.669 ¹⁴¹	80.14 ²¹⁸	44.204 ¹³³	20.73 ²²⁷
15.4	32.553 ⁹²	61.79 ⁵⁹	16.048 ⁹²	47.07 ⁶⁶	12.528 ¹⁸³	82.32 ¹⁷⁸	44.071 ¹⁶⁵	23.00 ¹⁹⁹
25.3	32.461 ¹¹³	62.38 ¹¹⁵	15.956 ¹¹⁵	47.73 ³⁸	12.345 ²²¹	84.10 ¹³⁸	43.906 ¹⁸⁹	24.99 ¹⁶⁵
Dec. 5.3	32.348 ¹²⁸	62.68 ²	15.841 ¹³²	48.11 ⁵	12.124 ²⁵²	85.48 ⁹²	43.717 ²⁰⁸	26.64 ¹²⁵
15.3	32.220 ¹⁴²	62.70 ³¹	15.709 ¹⁴⁵	48.16 ²⁴	11.872 ²⁷⁷	86.40 ³⁹	43.509 ²¹⁸	27.89 ⁸⁰
25.3	32.078 ¹⁵¹	62.39 ⁵⁹	15.564 ¹⁵⁵	47.92 ⁵⁸	11.595 ²⁹⁴	86.79 ¹¹	43.291 ²¹⁸	28.69 ³²
35.2	31.927	61.80	15.409	47.34	11.301	86.68	43.073	29.01
Mean Place	28.946	37.94	12.368	22.85	7.611	55.01	41.313	28.71
Sec δ, Tan δ	1.142	+0.552	1.160	+0.588	1.794	+1.489	1.453	-1.054
Dψα, Dωα	+0.063	-0.036	+0.064	-0.039	+0.067	-0.098	+0.057	+0.069
Dψδ, Dωδ	+0.39	+0.15	+0.39	+0.15	+0.39	+0.16	+0.39	+0.16

APPARENT PLACES OF STARS, 1923.

321

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ceti. Mag. 2.2		α Cassiopeiæ. Mag. 4.7		β Cassiopeiæ. Mag. 5.6		ζ Andromedæ. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 39	° ' " -18 24	h m 0 40	° ' " +47 51	h m 0 40	° ' " +74 33	h m 0 43	° ' " +23 50
	s	"	s	"	s	"	s	"
Jan. 0.3	43.250	42.07	26.283	59.62	34.34	79.97	15.448	59.46
10.2	43.115 ¹³⁵	42.62 ⁵⁵	26.052 ²³¹	59.12 ⁵⁰	33.60 ⁷⁴	79.95 ²	15.305 ¹⁴³	58.72 ⁷⁴
20.2	42.983 ¹³²	42.95 ³³	25.820 ²³²	58.15 ⁹⁷	32.87 ⁷³	79.27 ⁶⁸	15.161 ¹⁴⁴	57.79 ⁹³
30.2	42.857 ¹²⁶	42.99 ⁴	25.594 ²²⁶	56.78 ¹³⁷	32.17 ⁷⁰	78.01 ¹²⁶	15.019 ¹¹²	56.67 ¹¹²
Feb. 9.1	42.744 ¹¹³	42.78 ²¹	25.388 ²⁰⁶	55.06 ¹⁷²	31.53 ⁶¹	76.24 ¹⁷⁷	14.888 ¹³¹	55.42 ¹²⁵
	100	51	179	201	56	223	112	133
19.1	42.644	42.27	25.209	53.05	30.97	74.01	14.776	54.09
Mar. 1.1	42.571 ⁷³	41.50 ⁷⁷	25.067 ¹⁴²	50.85 ²²⁰	30.52 ⁴⁵	71.40 ²⁶¹	14.687 ⁸⁹	52.75 ¹³⁴
11.1	42.522 ⁴⁹	40.47 ¹⁰³	24.975 ⁹²	48.55 ²³⁰	30.21 ³¹	68.54 ²⁸⁶	14.628 ⁵⁹	51.47 ¹²⁸
21.0	42.510 ¹²	39.19 ¹²⁸	24.936 ³⁹	46.25 ²³⁰	30.03 ¹⁸	65.51 ³⁰³	14.608 ²⁰	50.29 ¹¹⁸
31.0	42.533 ²³	37.66 ¹⁵³	24.957 ²¹	44.05 ²²⁰	30.01 ²	62.47 ³⁰⁴	14.631 ²³	49.29 ¹⁰⁰
	66	176	81	204	14	295	68	77
Apr. 10.0	42.599	35.90	25.038	42.01	30.15	59.52	14.699	48.52
20.0	42.707 ¹⁰⁸	33.96 ¹⁹⁴	25.184 ¹⁴⁶	40.27 ¹⁷⁴	30.44 ²⁹	56.80 ²⁷²	14.814 ¹¹⁵	48.02 ⁵⁰
29.9	42.857 ¹⁵⁰	31.83 ²¹³	25.391 ²⁰⁷	38.86 ¹⁴¹	30.88 ⁴⁴	54.37 ²⁴³	14.974 ¹⁶⁰	47.85 ¹⁷
May 9.9	43.044 ¹⁸⁷	29.60 ²²³	25.654 ²⁶³	37.85 ¹⁰¹	31.45 ⁵⁷	52.36 ²⁰¹	15.178 ²⁰⁴	48.01 ¹⁶
19.9	43.273 ²²⁹	27.29 ²³¹	25.966 ³¹²	37.26 ⁵⁹	32.12 ⁶⁷	50.78 ¹⁵⁸	15.419 ²⁴¹	48.51 ⁵⁰
	253	232	353	12	77	106	276	83
29.8	43.531	24.97	26.319	37.14	32.89	49.72	15.695	49.34
June 8.8	43.817 ²⁸⁶	22.68 ²²⁹	26.701 ³⁸²	37.49 ³⁵	33.72 ⁸³	49.19 ⁵³	15.996 ³⁰¹	50.49 ¹¹⁵
18.8	44.120 ³⁰³	20.49 ²¹⁹	27.103 ⁴⁰²	38.26 ⁷⁷	34.59 ⁸⁷	49.21 ²	16.311 ³¹⁵	51.91 ¹⁴²
28.8	44.434 ³¹⁴	18.40 ²⁰⁹	27.513 ⁴¹⁰	39.47 ¹²¹	35.48 ⁸⁹	49.79 ⁵⁸	16.637 ³²⁶	53.59 ¹⁶⁸
July 8.7	44.750 ³¹⁶	16.57 ¹⁸³	27.921 ⁴⁰⁸	41.11 ¹⁶⁴	36.36 ⁸⁸	50.90 ¹¹¹	16.961 ³²⁴	55.47 ¹⁸⁸
	308	158	394	195	86	159	317	202
18.7	45.058 ²⁹⁴	14.99 ¹³⁰	28.315 ³⁷⁴	43.06 ²²⁹	37.22 ⁸⁰	52.49 ²⁰⁷	17.278 ²⁹⁹	57.49 ²¹³
28.7	45.352 ²⁷¹	13.69 ⁹⁹	28.689 ³⁴¹	45.35 ²⁵⁰	38.02 ⁷⁴	54.56 ²⁵⁰	17.577 ²⁷⁶	59.62 ²¹⁷
Aug. 7.7	45.626 ²⁴³	12.70 ⁶⁰	29.030 ³⁰⁵	47.85 ²⁷²	38.76 ⁶⁵	57.06 ²⁸⁴	17.853 ²⁴⁶	61.79 ²¹⁷
17.6	45.869 ²¹²	12.10 ²⁸	29.335 ²⁶⁴	50.57 ²⁸⁴	39.41 ⁵⁷	59.90 ³¹¹	18.099 ²¹⁴	63.96 ²¹¹
27.6	46.081 ¹⁷⁶	11.82 ¹⁰	29.599 ²¹⁷	53.41 ²⁸⁹	39.98 ¹⁵	63.01 ³³⁸	18.313 ¹⁷⁸	66.07 ²⁰³
Sept. 6.6	46.257 ¹³⁷	11.92 ⁴²	29.816 ¹⁶⁷	56.30 ²⁹²	40.43 ³⁵	66.39 ³⁵⁵	18.491 ¹⁴¹	68.10 ¹⁸⁹
16.5	46.394 ⁹⁹	12.34 ⁷¹	29.983 ¹¹⁹	59.22 ²⁸⁸	40.78 ²³	69.94 ³⁵⁸	18.632 ¹⁰³	69.99 ¹⁷²
26.5	46.493 ⁵⁸	13.05 ⁹⁸	30.102 ⁷⁰	62.10 ²⁷⁸	41.01 ¹¹	73.52 ³⁶⁴	18.735 ⁶⁷	71.71 ¹⁵⁴
Oct. 6.5	46.551 ²³	14.03 ¹¹⁸	30.172 ²⁷	64.88 ²⁶¹	41.12 ¹	77.16 ³⁵⁶	18.802 ³²	73.25 ¹³⁴
16.5	46.574 ¹²	15.21 ¹²⁹	30.199 ¹⁹	67.49 ²⁴⁰	41.11 ¹³	80.72 ³⁴²	18.834 ⁰	74.59 ¹¹¹
26.4	46.562	16.50	30.180	69.89	40.98	84.14	18.834	75.70
Nov. 5.4	46.523 ³⁹	17.90 ¹⁴⁰	30.120 ⁶⁰	72.07 ²¹⁸	40.74 ²⁴	87.36 ³²²	18.805 ²⁹	76.60 ⁹⁰
15.4	46.457 ⁶⁶	19.31 ¹⁴¹	30.020 ¹⁰⁰	73.89 ¹⁸²	40.38 ³⁶	90.23 ²⁸⁷	18.749 ⁵⁶	77.25 ⁶⁵
25.4	46.371 ⁸⁶	20.67 ¹³⁶	29.887 ¹³³	75.38 ¹⁴⁹	39.92 ⁴⁶	92.74 ²⁵¹	18.670 ⁷⁹	77.65 ⁴⁰
Dec. 5.3	46.266 ¹⁰⁵	21.92 ¹²⁵	29.723 ¹⁶⁴	76.48 ¹¹⁰	39.37 ⁵⁵	94.80 ²⁰⁶	18.573 ⁹⁷	77.79 ¹⁴
	118	112	192	66	62	153	116	10
15.3	46.148	23.04	29.531	77.14	38.75	96.33	18.457	77.69
25.3	46.023 ¹²⁵	23.97 ⁹³	29.320 ²¹¹	77.36 ²²	38.06 ⁶⁹	97.30 ⁹⁷	18.327 ¹³⁰	77.34 ³⁵
35.2	45.891 ¹³²	24.64 ⁶⁷	29.094 ²²⁶	77.13 ²³	37.34 ⁷²	97.66 ³⁶	18.188 ¹³⁹	76.75 ⁵⁹
Mean Place	43.517	32.12	25.618	47.67	31.996	62.90	15.201	54.82
Sec δ , Tan δ	1.054	-0.333	1.491	+1.105	3.758	+3.623	1.093	+0.442
$D\psi\alpha$, $D\omega\alpha$	+0.060	+0.022	+0.066	-0.073	+0.078	-0.238	+0.063	-0.029
$D\psi\delta$, $D\omega\delta$	+0.39	+0.17	+0.39	+0.18	+0.39	+0.18	+0.39	+0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cassiopeiæ. Mag. 3.6		δ Piscium. Mag. 4.6		λ Hydri. Mag. 5.0		ϵ Ceti. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 44	° ' " +57 24	h m 0 44	° ' " + 7 9	h m 0 45	° ' " -75 20	h m 0 49	° ' " - 1 33
	s	"	s	"	s	"	s	"
Jan. 0.3	26.902	44.75	41.188	57.49	53.60	54.26	4.244	47.46
10.2	26.595 ³⁰⁷	44.42 ³³	41.064 ¹²⁴	56.73 ⁷⁶	52.82 ⁷⁸	53.71 ⁵⁵	4.121 ¹²³	48.18 ⁷²
20.2	26.286 ³⁰⁹	43.56 ⁸⁶	40.939 ¹²⁵	55.95 ⁷⁸	52.06 ⁷⁶	52.56 ¹¹⁵	3.997 ¹²⁴	48.84 ⁶⁶
30.2	25.987 ²⁹⁹	42.23 ¹³³	40.817 ¹²²	55.17 ⁷⁸	51.37 ⁶⁹	50.84 ¹⁷²	3.875 ¹²²	49.40 ⁵⁶
Feb. 9.1	25.709 ²⁷⁸	40.47 ¹⁷⁶	40.705 ¹¹²	54.43 ⁷⁴	50.73 ⁶⁴	48.60 ²²¹	3.763 ¹¹²	49.84 ⁴⁴
	241	213	99	66	55	268	100	28
19.1	25.468 ¹⁹³	38.34 ²⁴⁰	40.606 ⁷⁶	53.77 ⁵⁷	50.18 ⁴⁴	45.92 ³⁰⁷	3.663 ⁷⁸	50.12 ¹³
Mar. 1.1	25.275 ¹³³	35.94 ²⁵⁸	40.530 ⁵⁰	53.20 ⁴³	49.74 ³¹	42.85 ³³⁶	3.585 ⁵⁹	50.25 ⁷
11.1	25.142 ⁶⁴	33.36 ²⁶³	40.480 ¹⁶	52.77 ²²	49.40 ²⁰	39.49 ³⁵⁷	3.532 ¹⁹	50.18 ²⁹
21.0	25.078 ¹⁰	30.73 ²⁵⁹	40.464 ²¹	52.55 ¹	49.20 ⁹	35.92 ³⁷¹	3.513 ¹⁶	49.89 ⁵²
31.0	25.088 ⁹⁰	28.14 ²⁴⁴	40.485 ⁶³	52.54 ²³	49.11 ⁵	32.21 ³⁷⁷	3.529 ⁵⁷	49.37 ⁷⁶
Apr. 10.0	25.178 ¹⁶⁸	25.70 ²¹⁹	40.548 ¹⁰⁵	52.77 ⁴⁹	49.16 ¹⁹	28.44 ³⁷⁴	3.586 ⁹⁰	48.61 ¹⁰⁰
20.0	25.346 ²⁴²	23.51 ¹⁸⁷	40.653 ¹⁴⁸	53.26 ⁷⁶	49.35 ³²	24.70 ³⁶³	3.685 ¹³⁹	47.61 ¹²⁵
29.9	25.588 ³¹¹	21.64 ¹⁴⁷	40.801 ¹⁸⁷	54.02 ¹⁰²	49.67 ⁴⁴	21.07 ³⁴⁴	3.824 ¹⁸⁰	46.36 ¹⁴⁵
May 9.9	25.899 ³⁷²	20.17 ¹⁰¹	40.988 ²²⁵	55.04 ¹²⁷	50.11 ⁵⁶	17.63 ³¹⁸	4.004 ²¹⁸	44.91 ¹⁶⁶
19.9	26.271 ⁴²⁰	19.16 ⁵⁴	41.213 ²⁵⁵	56.31 ¹⁴⁹	50.67 ⁶⁸	14.45 ²⁸⁵	4.222 ²⁴⁹	43.25 ¹⁸¹
29.8	26.691 ⁴⁵⁸	18.62 ⁴	41.468 ²⁸⁰	57.80 ¹⁶⁹	51.35 ⁷⁶	11.60 ²¹³	4.471 ²⁷⁴	41.44 ¹⁹³
June 8.8	27.149 ⁴⁸⁰	18.58 ⁴⁶	41.748 ²⁹⁷	59.49 ¹⁸¹	52.11 ⁸⁴	9.17 ¹⁹⁹	4.745 ²⁹²	39.51 ¹⁹⁸
18.8	27.629 ⁴⁹³	19.04 ⁹⁴	42.045 ³⁰⁷	61.30 ¹⁹¹	52.95 ⁸⁸	7.18 ¹¹⁷	5.037 ³⁰²	37.53 ²⁰⁰
28.8	28.122 ⁴⁸⁹	19.98 ¹³⁹	42.352 ³⁰⁵	63.21 ¹⁹⁶	53.83 ⁹¹	5.71 ⁹¹	5.339 ³⁰⁵	35.53 ¹⁹⁶
July 8.7	28.611 ⁴⁷⁵	21.37 ¹⁸²	42.657 ³⁰⁰	65.17 ¹⁹⁵	54.74 ⁹²	4.80 ³⁵	5.644 ²⁹⁹	33.57 ¹⁸⁶
18.7	29.086 ⁴⁴⁹	23.19 ²¹⁸	42.957 ²⁸⁵	67.12 ¹⁸⁸	55.66 ⁸⁸	4.45 ²⁴	5.943 ²⁸⁵	31.71 ¹⁷²
28.7	29.535 ⁴¹³	25.37 ²⁵¹	43.242 ²⁶²	69.00 ¹⁷⁸	56.54 ⁸⁴	4.69 ⁸¹	6.228 ²⁶⁴	29.99 ¹⁵³
Aug. 7.7	29.948 ³⁷⁰	27.88 ²⁷⁷	43.504 ²³⁸	70.78 ¹⁶²	57.38 ⁷⁷	5.50 ¹³⁷	6.492 ²³⁹	28.46 ¹³¹
17.6	30.318 ³²⁰	30.65 ²⁹⁶	43.742 ²⁰⁵	72.40 ¹⁴⁴	58.15 ⁶⁵	6.87 ¹⁸⁷	6.731 ²⁰⁸	27.15 ¹⁰⁶
27.6	30.638 ²⁶⁶	33.61 ³¹⁰	43.947 ¹⁷¹	73.84 ¹²³	58.80 ⁵¹	8.74 ²³²	6.939 ¹⁷⁵	26.09 ⁷⁹
Sept. 6.6	30.904 ²⁰⁸	36.71 ³¹⁷	44.118 ¹³⁶	75.07 ¹⁰²	59.34 ⁴⁰	11.06 ²⁶⁹	7.114 ¹⁴⁰	25.30 ⁵⁴
16.5	31.112 ¹⁴⁹	39.88 ³¹⁹	44.254 ⁹⁹	76.09 ⁷⁷	59.74 ²⁶	13.75 ²⁹⁵	7.254 ¹⁰³	24.76 ²⁶
26.5	31.261 ⁸⁹	43.07 ³¹⁴	44.353 ⁶⁵	76.86 ⁵⁶	60.00 ⁹	16.70 ³¹¹	7.357 ⁶⁹	24.50 ²
Oct. 6.5	31.350 ³³	46.21 ³⁰⁰	44.418 ³³	77.42 ³²	60.09 ⁶	19.81 ³¹⁶	7.426 ³⁵	24.48 ²¹
16.5	31.383 ²⁵	49.21 ²⁸³	44.451 ³	77.74 ¹³	60.03 ²²	22.97 ³⁰⁶	7.461 ⁶	24.69 ³⁹
26.4	31.358 ⁷⁸	52.04 ²⁵⁸	44.454 ²⁵	77.87 ⁵	59.81 ³⁷	26.03 ²⁸⁷	7.467 ²³	25.08 ⁵⁵
Nov. 5.4	31.280 ¹²⁷	54.62 ²²⁷	44.429 ⁴⁷	77.82 ²³	59.44 ⁴⁸	28.90 ²⁵⁵	7.444 ⁴⁵	25.63 ⁶⁷
15.4	31.153 ¹⁷⁵	56.89 ¹⁹¹	44.382 ⁶⁹	77.59 ³⁶	58.96 ⁵³	31.45 ²¹²	7.399 ⁶⁸	26.30 ⁷⁴
25.4	30.978 ²¹⁷	58.80 ¹⁴⁹	44.313 ⁸⁶	77.23 ⁴⁹	58.37 ⁶⁸	33.57 ¹⁶³	7.331 ⁹⁴	27.04 ⁷⁹
Dec. 5.3	30.761 ²⁵⁵	60.29 ¹⁰³	44.227 ¹⁰⁰	76.74 ⁵⁸	57.69 ⁷⁴	35.20 ¹⁰⁶	7.247 ⁹⁹	27.83 ⁸¹
15.3	30.506 ²⁷⁹	61.32 ⁵⁰	44.127 ¹¹³	76.16 ⁶⁶	56.95 ⁷⁷	36.26 ⁴⁵	7.148 ¹¹¹	28.64 ⁸⁰
25.3	30.227 ²⁹⁹	61.82 ¹	44.014 ¹²¹	75.50 ⁷³	56.18 ⁷⁸	36.71 ¹⁸	7.037 ¹¹⁸	29.44 ⁷⁴
35.2	29.928	61.83	43.893	74.77	55.40	36.53	6.919	30.18
Mean Place	25.892	30.72	41.135	58.72	55.853	31.71	4.262	42.94
Sec δ , Tan δ	1.857	+1.564	1.008	+0.126	3.952	-3.823	1.000	-0.027
D $\psi\alpha$, D $\omega\alpha$	+0.069	-0.102	+0.062	-0.008	+0.041	+0.250	+0.061	+0.002
D $\psi\delta$, D $\omega\delta$	+0.39	+0.19	+0.39	+0.19	+0.39	+0.20	+0.39	+0.21

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cassiopeiæ. Mag. 2.2		μ Andromedæ. Mag. 3.9		α Sculptoris. Mag. 4.4		ϵ Piscium. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 0 52	° ' +60 17	h m 0 52	° ' +38 4	h m 0 54	° ' -29 46	h m 0 58	° ' + 7 28
	s	"	s	"	s	"	s	"
Jan. 0.3	4.06	74.70	28.936	63.87	53.404	39.05	56.840	31.51
10.2	3.71	74.52	28.753	63.34	53.245	39.55	56.714	30.78
20.2	3.36	73.81	28.567	62.45	53.086	39.67	56.585	30.03
30.2	3.02	72.55	28.385	61.24	52.930	39.44	56.456	29.25
Feb. 9.2	2.70	70.87	28.213	59.76	52.788	38.83	56.334	28.53
19.1	2.42	68.79	28.061	58.06	52.663	37.88	56.226	27.89
Mar. 1.1	2.19	66.43	27.940	56.24	52.560	36.60	56.139	27.34
11.1	2.02	63.85	27.852	54.36	52.487	34.99	56.076	26.89
21.0	1.93	61.18	27.814	52.50	52.449	33.12	56.047	26.67
31.0	1.92	58.52	27.823	50.76	52.450	30.98	56.054	26.66
Apr. 10.0	2.00	55.96	27.886	49.20	52.495	28.64	56.104	26.85
20.0	2.16	53.65	28.002	47.89	52.587	26.13	56.194	27.32
29.9	2.40	51.64	28.173	46.93	52.736	23.48	56.330	28.02
May 9.9	2.72	50.03	28.396	46.30	52.904	20.78	56.504	29.02
19.9	3.10	48.85	28.661	46.09	53.127	18.07	56.717	30.26
29.9	3.54	48.12	28.964	46.26	53.386	15.41	56.963	31.67
June 8.8	4.02	47.91	29.297	46.84	53.677	12.88	57.237	33.32
18.8	4.53	48.20	29.649	47.82	53.990	10.52	57.527	35.10
28.8	5.05	48.99	30.013	49.12	54.319	8.40	57.830	36.97
July 8.7	5.57	50.25	30.377	50.78	54.653	6.59	58.138	38.89
18.7	6.08	51.96	30.731	52.70	54.984	5.13	58.440	40.81
28.7	6.56	54.04	31.070	51.88	55.303	4.05	58.729	42.69
Aug. 7.7	7.02	56.49	31.383	57.21	55.602	3.38	58.998	44.46
17.6	7.42	59.21	31.666	59.68	55.875	3.13	59.243	46.07
27.6	7.77	62.17	31.912	62.21	56.113	3.33	59.461	47.52
Sept. 6.6	8.06	65.28	32.121	64.76	56.314	3.94	59.643	48.78
16.6	8.30	68.51	32.288	67.27	56.474	4.92	59.794	49.79
26.5	8.47	71.78	32.414	69.69	56.591	6.23	59.907	50.59
Oct. 6.5	8.58	75.01	32.499	71.99	56.667	7.80	59.987	51.15
16.5	8.62	78.17	32.542	74.11	56.702	9.61	60.034	51.53
26.4	8.60	81.14	32.550	76.04	56.697	11.52	60.054	51.66
Nov. 5.4	8.52	83.88	32.522	77.74	56.658	13.47	60.043	51.60
15.4	8.38	86.35	32.459	79.16	56.587	15.37	60.007	51.40
25.4	8.20	88.45	32.369	80.27	56.492	17.15	59.946	51.07
Dec. 5.3	7.96	90.12	32.250	81.05	56.374	18.76	59.869	50.59
15.3	7.68	91.31	32.109	81.49	56.240	20.09	59.773	50.02
25.3	7.37	92.03	31.948	81.57	56.092	21.13	59.663	49.38
35.3	7.03	92.20	31.773	81.25	55.939	21.81	59.543	48.67
Mean Place	2.841	60.41	28.396	55.13	53.709	24.92	56.700	33.23
Sec δ , Tan δ	2.019	+1.754	1.270	+0.784	1.152	-0.572	1.009	+0.131
$D\psi\alpha$, $D\omega\alpha$	+0.072	-0.114	+0.066	-0.051	+0.058	+0.037	+0.062	-0.008
$D\psi\delta$, $D\omega\delta$	+0.39	+0.23	+0.39	+0.23	+0.39	+0.24	+0.38	+0.25

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Phœnicis. Mag. 3.4		μ Cassiopeiæ. Mag. 5.3		η Ceti. Mag. 3.6		β Andromedæ. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 2	° ' " —47 7	h m 1 3	° ' " +54 32	h m 1 4	° ' " —10 35	h m 1 5	° ' " +35 12
	s	"	s	"	s	"	s	"
Jan. 0.3	38.371	71.32	9.115	48.69	42.947	32.16	25.445	52.86
10.2	38.137 ²³⁴	71.61 ²⁹	8.849 ²⁶⁶	48.49 ²⁰	42.819 ¹²⁸	32.90 ⁷⁴	25.275 ¹⁷⁰	52.39 ⁴⁷
20.2	37.905 ²³²	71.40 ²¹	8.573 ²⁷⁶	47.80 ⁶⁹	42.688 ¹³¹	33.45 ⁵⁵	25.099 ¹⁷⁶	51.60 ⁷⁹
30.2	37.680 ²²⁵	70.69 ⁷¹	8.299 ²⁷⁴	46.64 ¹¹⁶	42.557 ¹³¹	33.80 ³⁵	24.922 ¹⁷⁷	50.51 ¹⁰⁹
Feb. 9.2	37.471 ²⁰⁹	69.50 ¹¹⁹	8.041 ²⁵⁸	45.04 ¹⁶⁰	42.433 ¹²⁴	33.94 ¹⁴	24.752 ¹⁷⁰	49.16 ¹³⁵
	185	160	231	193	111	8	151	153
19.1	37.286 ¹⁵⁶	67.90 ²⁰²	7.810 ¹⁹¹	43.11 ²²²	42.322 ⁹⁴	33.86 ³²	24.601 ¹²⁶	47.63 ¹⁶⁷
Mar. 1.1	37.130 ¹¹⁶	65.88 ²³⁷	7.619 ¹⁴⁰	40.89 ²⁴²	42.228 ⁶⁸	33.54 ⁵⁵	24.475 ⁹⁶	45.96 ¹⁷¹
11.1	37.014 ⁷⁵	63.51 ²⁶⁷	7.479 ⁷⁹	38.47 ²⁵⁰	42.160 ³⁷	32.99 ⁸⁰	24.379 ⁵⁰	44.25 ¹⁶⁹
21.0	36.939 ²⁵	60.84 ²⁹²	7.400 ⁹	35.97 ²⁴⁹	42.123 ²	32.19 ¹⁰⁴	24.329 ⁶	42.56 ¹⁵⁹
31.0	36.914 ²⁶	57.92 ³⁰⁹	7.391 ⁶²	33.48 ²³⁸	42.121 ⁴⁰	31.15 ¹²⁹	24.323 ⁴⁷	40.97 ¹⁴¹
Apr. 10.0	36.940 ⁸⁴	54.83 ³²⁰	7.453 ¹³⁷	31.10 ²¹⁵	42.161 ⁸¹	29.86 ¹⁵¹	24.370 ¹⁰¹	39.56 ¹¹⁷
20.0	37.024 ¹³⁹	51.63 ³²⁷	7.590 ²⁰⁹	28.95 ¹⁸⁷	42.242 ¹²⁴	28.35 ¹⁷²	24.471 ¹⁴⁹	38.39 ⁸⁸
29.9	37.163 ¹⁹⁴	48.36 ³²⁴	7.799 ¹⁵⁰	27.08 ¹⁵⁰	42.366 ¹⁶⁶	26.63 ¹⁸⁹	24.620 ²⁰⁴	37.51 ⁵⁵
May 9.9	37.357 ²⁴⁵	45.12 ³¹⁶	8.076 ³³⁶	25.58 ¹⁰⁹	42.532 ²⁰⁶	24.74 ²⁰⁴	24.824 ²⁴⁸	36.96 ¹⁶
19.9	37.602 ²⁹³	41.96 ²⁹⁸	8.412 ³⁸⁸	24.49 ⁶⁴	42.738 ²³⁸	22.70 ²¹³	25.072 ²⁸⁵	36.80 ²⁰
29.9	37.895 ³³²	38.98 ²⁷⁵	8.800 ⁴²⁷	23.85 ¹⁷	42.976 ²⁶⁸	20.57 ²¹⁷	25.357 ³¹⁷	37.00 ⁵⁸
June 8.8	38.227 ³⁶³	36.23 ²⁴⁴	9.227 ⁴⁵³	23.68 ³¹	43.244 ²⁸⁸	18.40 ²¹⁵	25.674 ³³⁸	37.58 ⁹⁴
18.8	38.590 ³⁸⁵	33.79 ²⁰⁹	9.680 ⁴⁷⁰	23.99 ⁷⁶	43.532 ³⁰³	16.25 ²⁰⁸	26.012 ³⁵²	38.52 ¹²⁶
28.8	38.975 ³⁹⁷	31.70 ¹⁶⁴	10.150 ⁴⁷³	24.75 ¹²¹	43.835 ³⁰⁷	14.17 ¹⁹⁷	26.364 ³⁵⁶	39.78 ¹⁵⁹
July 8.7	39.372 ³⁹⁷	30.06 ¹²⁰	10.623 ⁴⁶⁴	25.96 ¹⁶²	44.142 ³⁰³	12.20 ¹⁷⁹	26.720 ³⁴⁸	41.37 ¹⁸⁵
18.7	39.769 ³⁸⁶	28.86 ⁷⁰	11.087 ⁴⁴⁵	27.58 ¹⁹⁸	44.445 ²⁹⁴	10.41 ¹⁵⁶	27.068 ³³⁴	43.22 ²⁰⁵
28.7	40.155 ³⁶⁶	28.16 ¹⁸	11.532 ⁴¹⁵	29.56 ²²⁸	44.739 ²⁷⁶	8.85 ¹²⁹	27.402 ³¹⁶	45.27 ²²⁰
Aug. 7.7	40.521 ³³⁶	27.98 ³⁵	11.947 ³⁷⁸	31.84 ²⁵⁵	45.015 ²⁵²	7.56 ¹⁰¹	27.718 ²⁸³	47.47 ²³³
17.6	40.857 ²⁹⁵	28.33 ⁸⁵	12.325 ³³⁶	34.39 ²⁷⁵	45.267 ²²²	6.55 ⁶⁸	28.001 ²⁵⁴	49.80 ²³⁸
27.6	41.152 ²⁵¹	29.18 ¹³²	12.661 ²⁸⁷	37.14 ²⁸⁹	45.489 ¹⁹²	5.87 ³⁵	28.255 ²¹⁷	52.18 ²³⁷
Sept. 6.6	41.403 ²⁰⁰	30.50 ¹⁷⁴	12.948 ²³⁵	40.03 ²⁹⁸	45.681 ¹⁵⁵	5.52 ⁵	28.472 ¹⁷⁹	54.55 ²³³
16.6	41.603 ¹⁴⁶	32.24 ²⁰⁹	13.183 ¹⁸³	43.01 ³⁰⁰	45.836 ¹¹⁹	5.47 ²⁶	28.651 ¹³⁸	56.88 ²²⁷
26.5	41.749 ⁹⁰	34.33 ²³⁷	13.366 ¹²⁸	46.01 ²⁹⁶	45.955 ⁸⁴	5.73 ⁵³	28.789 ⁹⁹	59.15 ²¹³
Oct. 6.5	41.839 ³⁶	36.70 ²⁵⁴	13.494 ⁷⁶	48.97 ²⁸⁷	46.039 ⁵¹	6.26 ⁷⁶	28.888 ⁶²	61.28 ¹⁹⁸
16.5	41.875 ¹⁶	39.24 ²⁶²	13.570 ²³	51.84 ²⁷¹	46.090 ¹⁸	7.02 ⁹⁴	28.950 ²⁶	63.26 ¹⁷⁸
26.4	41.859 ⁶⁶	41.86 ²⁵⁹	13.593 ²⁸	54.55 ²⁴⁹	46.108 ¹²	7.96 ¹⁰⁶	28.976 ¹¹	65.04 ¹⁵⁶
Nov. 5.4	41.793 ¹⁰⁷	44.45 ²⁴⁵	13.565 ⁷⁷	57.04 ²²¹	46.096 ³⁷	9.02 ¹¹⁴	28.965 ⁴²	66.60 ¹²⁹
15.4	41.686 ¹⁴⁶	46.90 ²²¹	13.488 ¹²²	59.25 ¹⁹⁰	46.059 ⁶²	10.16 ¹¹⁷	28.923 ⁷⁴	67.89 ¹⁰⁴
25.4	41.540 ¹⁷⁷	49.11 ¹⁸⁹	13.366 ¹⁶⁴	61.15 ¹⁵⁰	45.997 ⁸⁰	11.33 ¹¹³	28.849 ⁹⁹	68.93 ⁷²
Dec. 5.3	41.363 ²⁰⁰	51.00 ¹⁵²	13.202 ²⁰²	62.65 ¹⁰⁸	45.917 ⁹⁸	12.46 ¹⁰⁶	28.750 ¹²⁵	69.65 ⁴³
15.3	41.163 ²¹⁸	52.52 ¹⁰⁷	13.000 ²³⁴	63.73 ⁶¹	45.819 ¹¹¹	13.52 ⁹⁶	28.625 ¹⁴⁶	70.08 ⁵
25.3	40.945 ²²⁸	53.59 ⁵⁸	12.766 ²⁵⁶	64.34 ¹¹	45.708 ¹²²	14.48 ⁸²	28.479 ¹⁶⁰	70.13 ²³
35.3	40.717	54.17	12.510	64.45	45.586	15.30	28.319	69.90
Mean Place	38.880	52.37	8.045	36.16	42.967	23.88	24.876	45.58
Sec δ , Tan δ	1.470	—1.077	1.724	+1.404	1.017	—0.187	1.224	+0.706
$D\psi\alpha$, $D\omega\alpha$	+0.053	+0.069	+0.071	—0.090	+0.060	+0.012	+0.066	—0.045
$D\psi\delta$, $D\omega\delta$	+0.38	+0.27	+0.38	+0.27	+0.38	+0.28	+0.38	+0.28

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Piscium. Mag. 4.7		ζ Piscium. Mag. 5.6		κ Tucanæ. Mag. 5.0		f Piscium. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 7	° ' +29 40	h m 1 9	° ' + 7 9	h m 1 13	° ' -69 16	h m 1 13	° ' + 3 12
	s	"	s	"	s	"	s	"
Jan. 0.3	25.369	57.99	42.591	64.55	8.50	89.42	49.724	29.78
10.2	25.216	57.46	42.468	63.83	7.94	89.38	49.601	29.03
20.2	25.055	56.66	42.338	63.09	7.40	88.75	49.470	28.33
30.2	24.893	55.64	42.207	62.36	6.88	87.84	49.339	27.68
Feb. 9.2	24.738	54.40	42.080	61.68	6.40	85.79	49.214	27.10
19.1	24.596	53.03	41.966	61.05	5.96	83.54	49.097	26.62
Mar. 1.1	24.478	51.58	41.869	60.52	5.59	80.86	48.998	26.27
11.1	24.391	50.10	41.798	60.13	5.28	77.84	48.924	26.10
21.1	24.341	48.67	41.758	59.92	5.07	74.51	48.879	26.11
31.0	24.336	47.36	41.754	59.90	4.95	70.97	48.873	26.33
Apr. 10.0	24.379	46.25	41.791	60.12	4.91	67.31	48.904	26.79
20.0	24.472	45.37	41.872	60.58	4.98	63.59	48.977	27.49
29.9	24.615	44.80	41.997	61.30	5.15	59.89	49.097	28.44
May 9.9	24.806	44.56	42.164	62.26	5.42	56.32	49.259	29.62
19.9	25.040	44.65	42.370	63.48	5.78	52.92	49.456	31.00
29.9	25.312	45.08	42.609	64.91	6.23	49.80	49.693	32.60
June 8.8	25.613	45.87	42.878	66.53	6.75	47.02	49.956	34.36
18.8	25.936	46.99	43.166	68.29	7.34	44.63	50.240	36.22
28.8	26.271	48.39	43.468	70.14	7.97	42.73	50.536	38.11
July 8.8	26.610	50.05	43.775	72.05	8.64	41.33	50.839	40.03
18.7	26.944	51.92	44.077	73.95	9.31	40.49	51.141	41.93
28.7	27.265	53.94	44.370	75.80	9.98	40.23	51.434	43.72
Aug. 7.7	27.565	56.09	44.645	77.54	10.63	40.57	51.708	45.36
17.6	27.838	58.29	44.897	79.14	11.23	41.48	51.963	46.84
27.6	28.081	60.50	45.119	80.56	11.76	42.92	52.188	48.12
Sept. 6.6	28.289	62.67	45.313	81.77	12.22	44.88	52.385	49.14
16.6	28.460	64.76	45.471	82.77	12.59	47.27	52.546	49.93
26.5	28.595	66.74	45.596	83.53	12.84	50.00	52.674	50.46
Oct. 6.5	28.693	68.58	45.688	84.06	13.00	52.98	52.769	50.78
16.5	28.754	70.24	45.746	84.37	13.04	56.09	52.830	50.84
26.5	28.781	71.71	45.774	84.49	12.98	59.22	52.864	50.69
Nov. 5.4	28.777	72.95	45.776	84.42	12.80	62.22	52.865	50.40
15.4	28.742	73.97	45.749	84.18	12.54	65.01	52.842	49.95
25.4	28.679	74.73	45.700	83.82	12.19	67.46	52.794	49.40
Dec. 5.3	28.592	75.23	45.630	83.35	11.77	69.47	52.724	48.75
15.3	28.481	75.45	45.541	82.78	11.29	70.97	52.637	48.04
25.3	28.351	75.39	45.436	82.15	10.78	71.90	52.534	47.33
35.3	28.205	75.07	45.320	81.47	10.25	72.22	52.418	46.60
Mean Place	24.882	52.51	42.392	66.83	9.541	66.52	49.546	33.61
Sec δ , Tan δ	1.151	+0.570	1.008	+0.126	2.827	-2.644	1.002	+0.056
$D\psi\alpha$, $D\omega\alpha$	+0.066	-0.036	+0.062	-0.008	+0.039	+0.167	+0.062	-0.004
$D\psi\delta$, $D\omega\delta$	+0.38	+0.29	+0.38	+0.30	+0.38	+0.31	+0.38	+0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7		θ Ceti. Mag. 3.8		δ Cassiopeiæ. Mag. 2.8		γ Phœnicis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 15	° ' " +26 51	h m 1 20	° ' " - 8 34	h m 1 20	° ' " +59 49	h m 1 24	° ' " -43 42
	s	"	s	"	s	"	s	"
Jan. 0.3	14.260	39.39	10.526	57.14	47.356	81.69	61.112	64.28
10.3	14.113 ¹⁴⁷	38.86 ⁵³	10.398 ¹²⁸	57.93 ⁷⁹	47.028 ³²⁸	81.85 ¹⁶	60.895 ²¹⁷	64.87 ⁵⁹
20.2	13.958 ¹⁵⁵	38.13 ⁷³	10.263 ¹³⁵	58.54 ⁶¹	46.684 ³⁴⁴	81.50 ³⁵	60.674 ²²¹	64.97 ¹⁰
30.2	13.800 ¹⁵⁸	37.17 ⁹⁶	10.129 ¹³⁴	59.00 ⁴⁶	46.337 ³⁴⁷	80.62 ⁸⁸	60.454 ²²⁰	64.59 ³⁸
Feb. 9.2	13.647 ¹⁵³	36.04 ¹¹³	9.998 ¹³¹	59.23 ²³	46.003 ³³⁴	79.27 ¹³⁵	60.245 ²⁰⁹	63.74 ⁸⁵
	140	124	124	2	307	178	194	130
19.1	13.507 ¹¹⁹	34.80 ¹³²	9.874 ¹⁰⁴	59.25 ¹⁸	45.696 ²⁶⁵	77.49 ²¹⁰	60.051 ¹⁶⁸	62.44 ¹⁷²
Mar. 1.1	13.388 ⁹²	33.48 ¹³³	9.770 ⁸⁰	59.07 ⁴⁴	45.431 ²⁰⁸	75.39 ²³⁹	59.883 ¹³⁸	60.72 ²⁰⁹
11.1	13.296 ⁵⁵	32.15 ¹²⁷	9.690 ⁵⁴	58.63 ⁶⁹	45.223 ¹⁴¹	73.00 ²⁵⁴	59.745 ⁹⁹	58.63 ²⁴¹
21.1	13.241 ¹¹	30.88 ¹¹³	9.636 ¹⁵	57.94 ⁸⁸	45.082 ⁶¹	70.46 ²⁵⁸	59.646 ⁵³	56.22 ²⁷¹
31.0	13.230 ³⁴	29.75 ⁹⁷	9.621 ²³	57.06 ¹¹⁷	45.021 ²²	67.88 ²⁵²	59.593 ⁴	53.51 ²⁹¹
Apr. 10.0	13.264 ⁸³	28.78 ⁷²	9.644 ⁶⁷	55.89 ¹⁴⁰	45.043 ¹⁰⁷	65.36 ²³⁷	59.589 ⁵⁰	50.60 ³⁰⁹
20.0	13.347 ¹³²	28.06 ⁴⁴	9.711 ¹⁰⁹	54.49 ¹⁵⁸	45.150 ¹⁹²	62.99 ²¹³	59.639 ¹⁰⁴	47.51 ³¹⁸
30.0	13.479 ¹⁷⁹	27.62 ¹³	9.820 ¹⁵²	52.91 ¹⁷⁹	45.342 ²⁷⁰	60.86 ¹⁸⁰	59.743 ¹⁵⁸	44.33 ³²¹
May 9.9	13.658 ²²²	27.49 ¹⁹	9.972 ¹⁸⁹	51.12 ¹⁹⁵	45.612 ³⁴¹	59.06 ¹⁴⁰	59.901 ²¹⁰	41.12 ³¹⁸
19.9	13.880 ²⁶⁰	27.68 ⁵⁴	10.161 ²²⁸	49.17 ²⁰⁵	45.956 ⁴⁰⁴	57.66 ⁹⁷	60.111 ²⁵⁸	37.94 ³⁰⁴
29.9	14.140 ²⁹²	28.22 ⁸⁵	10.389 ²⁵⁸	47.12 ²¹⁰	46.360 ⁴⁵⁵	56.69 ⁵¹	60.369 ²⁹⁸	34.90 ²⁸⁸
June 8.8	14.432 ³¹²	29.07 ¹¹⁵	10.647 ²⁸¹	45.02 ²¹³	46.815 ⁴⁹¹	56.18 ²	60.667 ³³²	32.02 ²⁶⁰
18.8	14.744 ³²⁷	30.22 ¹⁴⁰	10.928 ²⁹³	42.89 ²⁰⁹	47.306 ⁵¹⁴	56.16 ⁴⁶	60.999 ³⁵⁷	29.42 ²²⁸
28.8	15.071 ³³³	31.62 ¹⁶⁶	11.221 ³⁰³	40.80 ¹⁹⁹	47.820 ⁵²³	56.62 ⁹²	61.356 ³⁷²	27.14 ¹⁹¹
July 8.8	15.404 ³²⁸	33.28 ¹⁸⁴	11.524 ³⁰⁴	38.81 ¹⁸⁴	48.343 ⁵¹⁹	57.54 ¹³⁶	61.728 ³⁷⁷	25.23 ¹⁴⁶
18.7	15.732 ³¹⁹	35.12 ¹⁹⁷	11.828 ²⁹⁴	36.97 ¹⁶²	48.862 ⁵⁰¹	58.90 ¹⁷⁷	62.105 ³⁷³	23.77 ⁹⁹
28.7	16.051 ²⁹⁸	37.09 ²⁰⁶	12.122 ²⁷⁹	35.35 ¹³⁹	49.363 ⁴⁷⁶	60.67 ²¹³	62.478 ³⁵⁷	22.78 ⁴⁷
Aug. 7.7	16.349 ²⁷⁴	39.15 ²¹⁰	12.401 ²⁶¹	33.96 ¹⁰⁸	49.839 ⁴³⁹	62.80 ²⁴⁵	62.835 ³³²	22.31 ⁴
17.7	16.623 ²⁴⁵	41.25 ²⁰⁹	12.662 ²³¹	32.88 ⁸⁰	50.278 ³⁹³	65.25 ²⁷⁰	63.167 ³⁰⁰	22.35 ⁵⁵
27.6	16.868 ²¹²	43.34 ²⁰⁵	12.893 ²⁰⁰	32.08 ⁴⁹	50.671 ³⁴⁴	67.95 ²⁹⁰	63.467 ²⁶⁰	22.90 ¹⁰⁵
Sept. 6.6	17.080 ¹⁷⁶	45.39 ¹⁹⁴	13.093 ¹⁷¹	31.59 ¹⁶	51.015 ²⁸⁷	70.85 ³⁰⁴	63.727 ²¹⁶	23.95 ¹⁴⁹
16.6	17.256 ¹⁴³	47.33 ¹⁸²	13.264 ¹³³	31.43 ¹⁵	51.302 ²²⁸	73.89 ³¹²	63.943 ¹⁶⁹	25.44 ¹⁸⁸
26.5	17.399 ¹⁰⁴	49.15 ¹⁶⁶	13.397 ¹⁰¹	31.58 ⁴⁰	51.530 ¹⁷⁰	77.01 ³¹⁵	64.112 ¹¹⁷	27.32 ²²¹
Oct. 6.5	17.503 ⁷⁰	50.81 ¹⁵⁰	13.498 ⁶⁵	31.98 ⁶⁵	51.700 ¹⁰⁶	80.16 ³⁰⁹	64.229 ⁶⁷	29.53 ²⁴²
16.5	17.573 ³⁶	52.31 ¹³⁰	13.563 ³⁵	32.63 ⁸⁷	51.806 ⁴⁷	83.25 ²⁹⁸	64.296 ¹⁸	31.95 ²⁵⁷
26.5	17.609 ⁵	53.61 ¹⁰⁹	13.598 ¹	33.50 ⁹⁷	51.853 ¹⁷	86.23 ²⁸⁰	64.314 ²⁹	34.52 ²⁵⁷
Nov. 5.4	17.614 ²⁵	54.70 ⁸⁸	13.599 ²⁰	34.47 ¹¹⁰	51.836 ⁷⁵	89.03 ²⁵⁹	64.285 ⁷²	37.09 ²⁵¹
15.4	17.589 ⁵¹	55.58 ⁶³	13.579 ⁴⁹	35.57 ¹¹³	51.761 ¹³³	91.62 ²²⁵	64.213 ¹⁰⁹	39.60 ²³⁴
25.4	17.538 ⁷⁹	56.21 ⁴⁰	13.530 ⁷⁰	36.70 ¹¹²	51.628 ¹⁸⁷	93.87 ¹⁹¹	64.104 ¹⁴²	41.94 ²⁰⁵
Dec. 5.4	17.459 ¹⁰⁰	56.61 ¹⁵	13.460 ⁹⁰	37.82 ¹⁰⁵	51.441 ²³⁵	95.78 ¹⁴⁷	63.962 ¹⁷⁰	43.99 ¹⁷²
15.3	17.359 ¹²¹	56.76 ⁹	13.370 ¹⁰⁷	38.87 ⁹⁹	51.206 ²⁷⁸	97.25 ¹⁰¹	63.792 ¹⁹²	45.71 ¹³¹
25.3	17.238 ¹³⁹	56.67 ³⁶	13.263 ¹²¹	39.86 ⁸⁴	50.928 ³¹⁵	98.26 ⁵¹	63.600 ²⁰⁷	47.02 ⁸⁶
35.3	17.099	56.31	13.142	40.70	50.613	98.77	63.393	47.88
Mean Place	13.771	35.19	10.431	48.95	45.872	68.96	61.357	45.47
Sec δ , Tan δ	1.121	+0.506	1.011	-0.151	1.990	+1.721	1.383	-0.956
$D\psi\alpha$, $D\omega\alpha$	+0.065	-0.032	+0.060	+0.009	+0.077	-0.108	+0.052	+0.059
$D\psi\delta$, $D\omega\delta$	+0.38	+0.32	+0.37	+0.34	+0.37	+0.35	+0.37	+0.36

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	38 Cassiopeiæ. Mag. 6.0		η Piscium. Mag. 3.7		ν Andromedæ. Mag. 4.2		40 Cassiopeiæ. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 25	° ' +69 51	h m 1 27	° ' +14 56	h m 1 32	° ' +41 1	h m 1 32	° ' +72 38
	s	"	s	"	s	"	s	"
Jan. 0.3	30.75	82.71	21.967	57.43	17.089	22.93	22.68	68.53
10.3	30.23	83.17	21.839	56.79	16.905	22.79	22.07	69.15
20.2	29.69	83.05	21.701	56.07	16.705	22.27	21.43	69.17
30.2	29.14	82.36	21.560	55.28	16.499	21.41	20.78	68.61
Feb. 9.2	28.61	81.11	21.419	54.44	16.295	20.22	20.16	67.47
19.1	28.12	79.36	21.290	53.59	16.104	18.78	19.57	65.81
Mar. 1.1	27.71	77.19	21.174	52.78	15.936	17.11	19.06	63.70
11.1	27.37	74.68	21.085	52.03	15.802	15.31	18.64	61.22
21.1	27.13	71.96	21.024	51.42	15.710	13.46	18.34	58.50
31.0	27.00	69.12	21.005	50.93	15.667	11.63	18.17	55.62
Apr. 10.0	27.01	66.29	21.024	50.67	15.679	9.92	18.14	52.73
20.0	27.13	63.56	21.091	50.66	15.749	8.38	18.25	49.92
30.0	27.36	61.05	21.203	50.88	15.878	7.10	18.50	47.29
May 9.9	27.72	58.85	21.358	51.38	16.064	6.12	18.88	44.96
19.9	28.18	57.02	21.554	52.14	16.301	5.49	19.38	42.98
29.9	28.73	55.63	21.790	53.18	16.584	5.23	19.98	41.45
June 8.8	29.34	54.72	22.055	54.43	16.904	5.36	20.67	40.37
18.8	30.01	54.32	22.343	55.90	17.253	5.88	21.42	39.79
28.8	30.72	54.43	22.648	57.56	17.620	6.75	22.22	39.74
July 8.8	31.44	55.05	22.958	59.32	17.996	7.98	23.04	40.20
18.7	32.15	56.16	23.269	61.15	18.372	9.52	23.86	41.16
28.7	32.85	57.73	23.571	63.02	18.738	11.32	24.65	42.60
Aug. 7.7	33.52	59.73	23.857	64.89	19.086	13.35	25.42	44.48
17.7	34.14	62.11	24.123	66.65	19.410	15.55	26.13	46.77
27.6	34.69	64.81	24.363	68.32	19.702	17.87	26.78	49.40
Sept. 6.6	35.17	67.79	24.574	69.84	19.960	20.27	27.35	52.34
16.6	35.58	70.97	24.753	71.19	20.180	22.69	27.84	55.49
26.5	35.91	74.29	24.897	72.37	20.360	25.09	28.23	58.83
Oct. 6.5	36.15	77.70	25.009	73.33	20.502	27.43	28.52	62.26
16.5	36.30	81.11	25.092	74.11	20.602	29.66	28.70	65.74
26.5	36.34	84.45	25.139	74.69	20.662	31.74	28.79	69.16
Nov. 5.4	36.31	87.65	25.157	75.08	20.684	33.64	28.76	72.47
15.4	36.18	90.63	25.146	75.28	20.668	35.32	28.62	75.60
25.4	35.97	93.33	25.112	75.34	20.615	36.74	28.38	78.43
Dec. 5.4	35.67	95.65	25.050	75.20	20.529	37.87	28.04	80.91
15.3	35.29	97.53	24.967	74.93	20.409	38.68	27.60	82.96
25.3	34.84	98.91	24.868	74.51	20.262	39.15	27.08	84.51
35.3	34.35	99.74	24.749	73.99	20.091	39.24	26.50	85.52
Mean Place	28.352	68.55	21.575	57.72	16.218	15.31	19.765	54.38
Sec δ, Tan δ	2.906	+2.729	1.035	+0.267	1.326	+0.870	3.353	+3.201
D _{ψα} , D _{ωα}	+0.088	-0.169	+0.064	-0.017	+0.070	-0.053	+0.094	-0.196
D _{ψδ} , D _{ωδ}	+0.37	+0.36	+0.37	+0.37	+0.37	+0.39	+0.37	+0.39

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Piscium. Mag. 5.6		ν Persei. Mag. 3.8		α Eridani. (Achernar.) Mag. 0.6		ω Cassiopeiae. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 33	° ' +11 44	h m 1 33	° ' +48 14	h m 1 34	° ' -57 37	h m 1 36	° ' +67 39
	s	"	s	"	s	"	s	"
Jan. 0.3	1.200	51.43	16.460	28.52	50.517	61.58	39.13	28.81
10.3	1.076 ¹²⁴	50.79 ⁶⁴	16.240 ²²⁰	28.53 ¹	50.188 ³²⁹	62.09 ⁵¹	38.68 ⁴⁵	29.35 ⁵⁴
20.2	0.940 ¹³⁶	50.09 ⁷⁰	16.003 ²³⁷	28.14 ³⁹	49.851 ³³⁷	62.01 ⁸	38.20 ⁴⁸	29.32 ³
30.2	0.800 ¹⁴⁰	49.35 ⁷⁴	15.756 ²⁴⁷	27.32 ⁸²	49.517 ³³⁴	61.39 ⁶²	37.71 ⁴⁹	28.75 ⁵⁷
Feb. 9.2	0.660 ¹⁴⁰	48.60 ⁷⁵	15.518 ²³⁸	26.11 ¹²¹	49.196 ³²¹	60.23 ¹¹⁶	37.23 ⁴⁸	27.62 ¹¹³
19.2	0.528 ¹³²	47.88 ⁷²	15.292 ²²⁶	24.56 ¹⁵⁵	48.902 ²⁹⁴	58.54 ¹⁶⁹	36.78 ⁴⁵	26.00 ¹⁶²
Mar. 1.1	0.412 ¹¹⁶	47.21 ⁶⁷	15.094 ¹⁹⁸	22.75 ¹⁸¹	48.639 ²⁶³	56.42 ²¹²	36.38 ⁴⁰	23.96 ²⁰⁴
11.1	0.318 ⁹⁴	46.63 ⁵⁸	14.935 ¹⁵⁹	20.73 ²⁰²	48.419 ²²⁰	53.87 ²⁵⁵	36.06 ³²	21.58 ²³⁸
21.1	0.255 ⁶³	46.17 ⁴⁶	14.824 ¹¹¹	18.63 ²¹⁰	48.250 ¹⁶⁹	51.01 ²⁸⁶	35.82 ²⁴	18.96 ²⁶²
31.0	0.228 ²⁷	45.90 ²⁷	14.771 ⁵³	16.48 ²¹⁵	48.140 ¹¹⁰	47.85 ³¹⁶	35.69 ¹³	16.22 ²⁷⁴
Apr. 10.0	0.243 ¹⁵	45.82 ⁸	14.779 ⁸	14.44 ²⁰⁴	48.095 ⁴⁵	44.48 ³³⁷	35.66 ³	13.46 ²⁷⁶
20.0	0.302 ⁵⁹	45.99 ¹⁷	14.853 ⁷⁴	12.56 ¹⁸⁸	48.120 ²⁵	40.96 ³⁵²	35.75 ⁹	10.79 ²⁶⁷
30.0	0.406 ¹⁰⁴	46.39 ⁴⁰	14.992 ¹³⁹	10.91 ¹⁶⁵	48.214 ⁹⁴	37.40 ³⁵⁶	35.95 ²⁰	8.32 ²⁴⁷
May 9.9	0.555 ¹⁴⁹	47.06 ⁶⁷	15.195 ²⁰³	9.58 ¹³³	48.376 ¹⁶²	33.87 ³⁵³	36.25 ³⁰	6.12 ²²⁰
19.9	0.745 ¹⁹⁰	47.98 ⁹²	15.455 ²⁶⁰	8.60 ⁹⁸	48.608 ²³²	30.44 ³⁴³	36.65 ⁴⁰	4.29 ¹⁸³
29.9	0.971 ²²⁶	49.15 ¹¹⁷	15.765 ³¹⁰	8.00 ⁶⁰	48.903 ²⁹⁵	27.17 ³²⁷	37.14 ⁴⁹	2.88 ¹⁴¹
June 8.9	1.230 ²⁵⁹	50.52 ¹³⁷	16.118 ³⁵³	7.83 ¹⁷	49.254 ³⁵¹	24.17 ³⁰⁰	37.69 ⁵⁵	1.93 ⁹⁵
18.8	1.512 ²⁸²	52.07 ¹⁵⁵	16.503 ³⁸⁵	8.07 ²⁴	49.654 ⁴⁰⁰	21.50 ²⁶⁷	38.30 ⁶¹	1.45 ⁴⁸
28.8	1.812 ³⁰⁰	53.78 ¹⁷¹	16.909 ⁴⁰⁶	8.74 ⁶⁷	50.089 ⁴³⁵	19.21 ²²⁹	38.94 ⁶⁴	1.49 ⁴
July 8.8	2.120 ³⁰⁸	55.56 ¹⁷⁸	17.325 ⁴¹⁶	9.79 ¹⁰⁵	50.551 ⁴⁶²	17.38 ¹⁸³	39.60 ⁶⁶	2.01 ⁵²
18.7	2.427 ³⁰⁷	57.40 ¹⁸⁴	17.740 ⁴¹⁵	11.21 ¹⁴²	51.022 ⁴⁷¹	16.06 ¹³²	40.26 ⁶⁶	3.02 ¹⁰¹
28.7	2.726 ²⁹⁹	59.23 ¹⁸³	18.144 ⁴⁰⁴	12.96 ¹⁷⁵	51.495 ⁴⁷³	15.27 ⁷⁹	40.91 ⁶⁵	4.49 ¹⁴⁷
Aug. 7.7	3.013 ²⁸⁷	61.02 ¹⁷⁹	18.530 ³⁸⁶	14.99 ²⁰³	51.954 ⁴⁵⁹	15.06 ²¹	41.53 ⁶²	6.37 ¹⁸⁸
17.7	3.278 ²⁶⁵	62.69 ¹⁶⁷	18.889 ³⁵⁹	17.25 ²²⁶	52.386 ⁴³²	15.40 ³⁴	42.12 ⁵⁹	8.64 ²²⁷
27.6	3.520 ²⁴²	64.24 ¹⁵⁵	19.215 ³²⁶	19.71 ²⁴⁶	52.781 ³⁹⁵	16.32 ⁹²	42.64 ⁵²	11.22 ²⁵⁸
Sept. 6.6	3.732 ²¹²	65.63 ¹³⁹	19.501 ²⁸⁶	22.27 ²⁵⁶	53.127 ³⁴⁶	17.77 ¹⁴⁵	43.11 ⁴⁷	14.08 ²⁸⁶
16.6	3.912 ¹⁸⁰	66.82 ¹¹⁹	19.747 ²⁴⁶	24.93 ²⁶⁶	53.414 ²⁸⁷	19.69 ¹⁹²	43.52 ⁴¹	17.15 ³⁰⁷
26.6	4.061 ¹⁴⁹	67.81 ⁹⁹	19.949 ²⁰²	27.61 ²⁶⁸	53.638 ²²⁴	22.02 ²³³	43.84 ³²	20.36 ³²¹
Oct. 6.5	4.177 ¹¹⁶	68.58 ⁷⁷	20.106 ¹⁵⁷	30.27 ²⁶⁶	53.796 ¹⁵⁸	24.66 ²⁶⁴	44.10 ²⁶	23.67 ³³¹
16.5	4.261 ⁸⁴	69.16 ⁵⁸	20.217 ¹¹¹	32.86 ²⁵⁹	53.883 ⁸⁷	27.54 ²⁸⁸	44.27 ¹⁷	26.98 ³³¹
26.5	4.314 ⁵³	69.54 ³⁸	20.281 ⁶⁴	35.32 ²⁴⁶	53.897 ¹⁴	30.52 ²⁹⁸	44.35 ⁸	30.25 ³²⁷
Nov. 5.4	4.338 ²⁴	69.72 ¹⁸	20.301 ²⁰	37.61 ²²⁹	53.844 ⁵³	33.49 ²⁹⁷	44.36 ¹	33.41 ³¹⁶
15.4	4.334 ⁴	69.74 ²	20.279 ²²	39.67 ²⁰⁶	53.728 ¹¹⁶	36.33 ²⁸⁴	44.28 ⁸	36.36 ²⁹⁵
25.4	4.303 ³¹	69.62 ¹²	20.213 ⁶⁶	41.48 ¹⁸¹	53.557 ¹⁷¹	38.95 ²⁶²	44.11 ¹⁷	39.04 ²⁶⁸
Dec. 5.4	4.249 ⁵⁴	69.37 ²⁵	20.107 ¹⁰⁶	42.96 ¹⁴⁸	53.335 ²²²	41.25 ²³⁰	43.87 ²⁴	41.36 ²³²
15.3	4.171 ⁷⁸	68.98 ³⁹	19.962 ¹⁴⁵	44.07 ¹¹¹	53.072 ²⁶³	43.08 ¹⁸³	43.56 ³¹	43.28 ¹⁹²
25.3	4.074 ⁹⁷	68.50 ⁴⁸	19.784 ¹⁷⁸	44.81 ⁷⁴	52.778 ²⁹⁴	44.44 ¹³⁶	43.18 ³⁸	44.72 ¹⁴⁴
35.3	3.961 ¹¹³	67.94 ⁵⁶	19.578 ²⁰⁶	45.13 ³²	52.460 ³¹⁸	45.28 ⁸⁴	42.75 ⁴³	45.63 ⁹¹
Mean Place	0.814	53.09	15.376	19.04	50.866	39.77	36.857	15.59
Sec δ , Tan δ	1.021	+0.208	1.502	+1.120	1.868	-1.577	2.630	+2.433
$D\psi\alpha$, $D\omega\alpha$	+0.063	-0.013	+0.073	-0.069	+0.044	+0.096	+0.088	-0.148
$D\psi\delta$, $D\omega\delta$	+0.37	+0.39	+0.37	+0.40	+0.36	+0.40	+0.36	+0.41

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Piscium. Mag. 4.7		ϕ Persei. Mag. 4.2		τ Ceti. Mag. 3.6		σ Piscium. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 37 s	° ' " + 5 5	h m 1 38 s	° ' " +50 17	h m 1 40 s	° ' " -16 20	h m 1 41 s	° ' " + 8 46
Jan. 0.3	25.674	50.43	50.643	74.97	29.540	44.36	19.906	11.43
10.3	25.553 ¹²¹	49.73 ⁷⁰	50.411 ²³²	75.11 ¹⁴	29.405 ¹³⁵	45.16 ⁸⁰	19.785 ¹²¹	10.77 ⁶⁶
20.2	25.421 ¹³²	49.04 ⁶⁹	50.160 ²⁵¹	74.80 ³¹	29.258 ¹⁴⁷	45.72 ⁵⁶	19.650 ¹³⁵	10.10 ⁶⁷
30.2	25.283 ¹³⁸	48.38 ⁶⁶	49.901 ²⁵⁹	74.07 ⁷³	29.107 ¹⁵¹	46.02 ³⁰	19.511 ¹³⁹	9.41 ⁶⁹
Feb. 9.2	25.145 ¹³⁸	47.78 ⁶⁰	49.644 ²⁵⁷	72.91 ¹¹⁶	28.958 ¹⁴⁹	46.04 ²	19.369 ¹⁴²	8.73 ⁶⁸
19.2	25.014 ¹³¹	47.26 ⁵²	49.402 ²⁴²	71.41 ¹⁵⁰	28.815 ¹⁴³	45.79 ²⁵	19.237 ¹³²	8.12 ⁶¹
Mar. 1.1	24.898 ¹¹⁶	46.86 ⁴⁰	49.188 ²¹⁴	71.41 ¹⁸¹	28.815 ¹²⁶	45.79 ⁵⁶	19.237 ¹²¹	8.12 ⁵⁴
11.1	24.803 ⁹⁵	46.61 ²⁵	49.013 ¹⁷⁵	69.60 ²⁰¹	28.689 ¹⁰⁶	45.23 ⁸³	19.116 ⁹⁷	7.58 ⁴⁴
21.1	24.737 ⁶⁶	46.51 ¹⁰	48.887 ¹²⁶	67.59 ²¹⁷	28.583 ⁷⁵	44.40 ¹¹¹	19.019 ⁷²	7.14 ²⁹
31.0	24.706 ³¹	46.61 ¹⁰	48.822 ⁶⁵	65.42 ²¹⁸	28.508 ⁴¹	43.29 ¹³⁷	18.947 ³³	6.85 ⁹
Apr. 10.0	24.715 ⁹	46.94 ³³	48.821 ¹	63.24 ²¹⁴	28.467 ⁰	41.92 ¹⁶³	18.914 ⁶	6.76 ¹⁰
20.0	24.767 ⁵²	47.49 ⁵⁵	48.889 ⁶⁸	61.10 ¹⁹⁸	28.467 ⁴³	40.29 ¹⁸³	18.920 ⁵²	6.86 ³³
30.0	24.864 ⁹⁷	48.29 ⁸⁰	49.024 ¹³⁵	59.12 ¹⁷⁶	28.510 ⁸⁶	38.46 ²⁰⁵	18.972 ⁹³	7.19 ⁵⁹
May 9.9	25.004 ¹⁴⁰	49.32 ¹⁰³	49.225 ²⁰¹	57.36 ¹⁴⁷	28.596 ¹³¹	36.41 ²²¹	19.065 ¹³⁹	7.78 ⁸²
19.9	25.186 ¹⁸²	50.59 ¹²⁷	49.488 ²⁶³	55.89 ¹¹¹	28.727 ¹⁷⁵	34.20 ²³¹	19.204 ¹⁸⁰	8.60 ¹⁰⁵
29.9	25.406 ²²⁰	52.04 ¹⁴⁵	49.804 ³¹⁶	54.78 ⁷²	28.902 ²¹³	31.89 ²⁴⁰	19.384 ²²⁰	9.65 ¹²⁶
June 8.9	25.657 ²⁵¹	52.04 ¹⁶⁴	49.804 ³⁶⁰	54.06 ³¹	29.115 ²⁴³	29.49 ²⁴⁰	19.604 ²⁵¹	10.91 ¹⁴⁶
18.8	25.932 ²⁷⁵	53.68 ¹⁷⁵	50.164 ³⁹⁵	53.75 ¹¹	29.358 ²⁷²	27.09 ²⁴⁰	19.855 ²⁵¹	12.37 ¹⁶⁴
28.8	26.225 ²⁸³	55.43 ¹⁸⁴	50.559 ⁴¹⁷	53.86 ⁵³	29.630 ²⁹¹	24.75 ²³⁴	20.131 ²⁷⁶	14.01 ¹⁸⁴
July 8.8	26.225 ³⁰¹	57.27 ¹⁸⁷	50.976 ⁴²⁹	54.41 ⁹³	29.921 ³⁰¹	22.52 ²⁰⁹	20.425 ³⁰⁴	15.74 ¹⁸²
18.7	26.526 ³⁰⁴	59.14 ¹⁸⁶	51.405 ⁴³²	55.34 ¹³²	30.222 ³⁰⁵	20.43 ¹⁸⁴	20.729 ³⁰⁵	17.56 ¹⁸³
Aug. 7.7	26.830 ²⁹⁷	61.00 ¹⁷⁸	51.837 ⁴²¹	56.66 ¹⁶⁸	30.527 ³⁰¹	18.59 ¹⁶⁰	21.034 ³⁰⁰	19.39 ¹⁸⁰
17.7	27.127 ²⁸⁵	62.78 ¹⁶⁶	52.258 ⁴⁰²	58.34 ¹⁹⁷	30.828 ²⁸⁷	16.99 ¹²⁵	21.334 ²⁸⁷	21.19 ¹⁷¹
27.6	27.412 ²⁶⁴	64.44 ¹⁵²	52.660 ³⁷⁶	60.31 ²²³	31.115 ²⁷⁰	15.74 ⁹²	21.621 ²⁶⁸	22.90 ¹⁶⁰
Sept. 6.6	27.676 ²⁴¹	65.96 ¹³²	53.036 ³⁴¹	62.54 ²⁴²	31.385 ²⁴⁵	14.82 ⁵⁵	21.889 ²⁴⁷	24.50 ¹⁴⁵
16.6	27.917 ²¹²	67.28 ¹⁰⁹	53.377 ³⁰⁶	64.96 ²⁵⁸	31.630 ²¹⁵	14.27 ¹⁸	22.136 ²¹⁶	25.95 ¹²⁴
Oct. 6.5	28.129 ¹⁸³	68.37 ⁸⁷	53.683 ²⁶¹	67.54 ²⁶⁹	31.845 ¹⁸³	14.09 ¹⁸	22.352 ¹⁸⁷	27.19 ¹⁰⁴
16.5	28.312 ¹⁵⁰	69.24 ⁶²	53.944 ²¹⁶	70.23 ²⁷²	32.028 ¹⁴⁹	14.27 ⁵⁵	22.539 ¹⁵⁶	28.23 ⁸²
Nov. 5.4	28.462 ¹¹⁸	69.86 ³⁹	54.160 ¹⁷⁰	72.95 ²⁷³	32.177 ¹¹⁴	14.82 ⁸⁴	22.695 ¹²⁶	29.05 ⁶⁰
15.4	28.580 ⁸⁷	70.25 ¹⁵	54.330 ¹²⁴	75.68 ²⁶⁶	32.291 ⁷⁸	15.66 ¹¹¹	22.821 ⁹¹	29.65 ³⁷
25.4	28.667 ⁵⁵	70.40 ³	54.454 ⁷⁵	78.34 ²⁵⁷	32.369 ⁴⁴	16.77 ¹³¹	22.912 ⁶²	30.02 ¹⁸
Dec. 5.4	28.722 ²⁶	70.37 ²³	54.529 ³⁰	80.91 ²³⁹	32.413 ¹³	18.08 ¹⁴⁴	22.974 ³¹	30.20 ⁰
15.3	28.748 ¹	70.14 ³⁶	54.559 ²⁰	83.30 ²¹⁹	32.426 ¹⁷	19.52 ¹⁵¹	23.005 ⁴	30.20 ¹⁴
25.3	28.747 ²⁸	69.78 ⁴⁸	54.539 ⁶³	85.49 ¹⁹⁴	32.409 ⁴⁵	21.03 ¹⁴⁹	23.009 ²⁶	30.06 ²⁹
35.3	28.719 ⁵⁰	69.30 ⁵⁸	54.476 ¹⁰⁷	87.43 ¹²⁵	32.364 ⁹¹	22.52 ¹³²	22.983 ⁷³	29.77 ⁵¹
Mean Place	25.338	54.57	49.446	65.31	29.414	32.75	19.510	14.47
Sec δ , Tan δ	1.004	+0.089	1.566	+1.205	1.042	-0.293	1.012	+0.154
$D\psi\alpha$, $D\omega\alpha$	+0.062	-0.005	+0.075	-0.073	+0.058	+0.018	+0.063	-0.009
$D\psi\delta$, $D\omega\delta$	+0.36	+0.41	+0.36	+0.42	+0.36	+0.42	+0.36	+0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sculptoris. Mag. 5.4		ζ Ceti. Mag. 3.9		α Trianguli. Mag. 3.6		ε Cassiopeiæ. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 42	° ' -25 25	h m 1 47	° ' -10 42	h m 1 48	° ' +29 12	h m 1 48	° ' +63 17
	s	"	s	"	s	"	s	"
Jan. 0.3	2.194	86.88 87	39.786	63.17 85	41.956	19.09	52.22	41.85 50
10.3	2.044 150	87.75 55	39.659 127	64.02 87	41.812 144	18.82 27	51.86 36	42.44 5
20.2	1.886 158	88.30 18	39.521 138	64.69 49	41.653 159	18.29 53	51.47 39	42.49 49
30.2	1.722 164	88.48 18	39.377 144	65.18 25	41.483 170	17.53 76	51.06 41	42.00 49
Feb. 9.2	1.560 162	88.30 18	39.232 145	65.43 1	41.312 171	16.60 93	50.66 40	40.99 101
	155	52	139		165	111	38	146
19.2	1.405	87.78 87	39.093 126	65.42 23	41.147 148	15.49 122	50.28 34	39.53 189
Mar. 1.1	1.267 138	86.91 121	38.967 106	65.19 50	40.999 124	14.27 129	49.94 28	37.64 221
11.1	1.152 115	85.70 151	38.861 79	64.69 75	40.875 89	12.98 129	49.66 22	35.43 245
21.1	1.067 85	84.19 179	38.782 43	63.94 99	40.786 51	11.69 121	49.44 13	32.98 258
31.1	1.016 7	82.40 205	38.739 4	62.95 126	40.735 2	10.48 109	49.31 6	30.40 260
Apr. 10.0	1.009	80.35 228	38.735 37	61.69 145	40.733 49	9.39 90	49.27 15	27.80 253
20.0	1.046 37	78.07 217	38.772 81	60.24 171	40.782 99	8.49 65	49.33 24	25.27 235
30.0	1.129 83	75.60 257	38.853 123	58.53 190	40.881 150	7.84 41	49.48 33	22.92 208
May 9.9	1.258 129	73.03 266	38.976 168	56.63 202	41.031 196	7.43 7	49.72 21	20.84 176
19.9	1.434 176	70.37 268	39.144 206	54.61 213	41.227 239	7.36 21	50.05 40	19.08 136
	215							
29.9	1.649	67.69 264	39.350 241	52.48 220	41.466 276	7.57 55	50.45 47	17.72 92
June 8.9	1.898 249	65.05 251	39.591 267	50.28 221	41.742 304	8.12 83	50.92 52	16.80 46
18.8	2.179 281	62.54 234	39.858 286	48.07 215	42.046 324	8.95 111	51.44 55	16.34 2
28.8	2.480 301	60.20 211	40.144 298	45.92 206	42.370 334	10.06 136	51.99 57	16.36 48
July 8.8	2.795 315	58.09 180	40.442 304	43.86 186	42.704 338	11.42 157	52.56 58	16.84 95
	320							
18.8	3.115	56.29 117	40.746 300	42.00 166	43.042 332	12.99 175	53.14 57	17.79 138
28.7	3.433 318	54.82 106	41.046 289	40.34 111	43.374 318	14.74 187	53.71 55	19.17 178
Aug. 7.7	3.740 307	53.76 67	41.335 273	38.93 110	43.692 300	16.61 194	54.26 51	20.95 212
17.7	4.026 286	53.09 23	41.608 250	37.83 78	43.992 273	18.55 197	54.77 48	23.07 245
27.6	4.289 263	52.86 20	41.858 222	37.05 44	44.265 246	20.52 194	55.25 43	25.52 269
	233							
Sept. 6.6	4.522	53.06 62	42.080 193	36.61 11	44.511 214	22.46 191	55.68 37	28.21 290
16.6	4.720 198	53.68 99	42.273 159	36.50 22	44.725 179	24.37 181	56.05 31	31.11 304
26.6	4.882 162	54.67 133	42.432 127	36.72 53	44.904 148	26.18 170	56.36 25	34.15 312
Oct. 6.5	5.007 125	56.00 160	42.559 93	37.25 80	45.052 109	27.88 157	56.61 18	37.27 315
16.5	5.094 87	57.60 179	42.652 60	38.05 97	45.161 78	29.45 141	56.79 11	40.42 309
	49							
26.5	5.143 15	59.39 191	42.712 29	39.02 117	45.239 43	30.86 123	56.90 4	43.51 300
Nov. 5.5	5.158 20	61.30 195	42.741 1	40.19 126	45.282 13	32.09 104	56.94 3	46.51 280
15.4	5.138 47	63.25 189	42.740 24	41.45 130	45.295 21	33.13 84	56.91 9	49.31 258
25.4	5.091 77	65.14 177	42.716 53	42.75 128	45.274 51	33.97 61	56.82 17	51.89 223
Dec. 5.4	5.014 101	66.91 160	42.663 77	44.03 121	45.223 81	34.58 38	56.65 23	54.12 185
15.3	4.913	68.51 133	42.586 96	45.24 110	45.142 106	34.96 14	56.42 29	55.97 142
25.3	4.791 122	69.84 106	42.490 115	46.34 96	45.036 131	35.10 11	56.13 34	57.39 93
35.3	4.651	70.90	42.375	47.30	44.905	34.99	55.79	58.32
Mean Place	2.117	72.56	39.545	53.31	41.233	15.77	50.224	30.13
Sec δ, Tan δ	1.107	-0.476	1.018	-0.189	1.146	+0.559	2.225	+1.988
Dψα, Dωα	+0.056	+0.029	+0.059	+0.011	+0.068	-0.033	+0.085	-0.118
Dψδ, Dωδ	+0.36	+0.43	+0.35	+0.45	+0.35	+0.46	+0.35	+0.46

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Piscum. Mag. 4.8		β Arietis. Mag. 2.7		ψ Phoenicis. Mag. 4.4		α Hydri. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 49	° ' " + 2 48	h m 1 50	° ' " +20 25	h m 1 50	° ' " -46 40	h m 1 56	° ' " -61 56
	s	"	s	"	s	"	s	"
Jan. 0.3	34.427	23.30	23.508	56.47	33.382	66.93	20.02	61.88
10.3	34.308	22.57	23.378	56.01	33.148	67.77	19.63	62.59
20.2	34.176	21.88	23.234	55.43	32.903	68.09	19.22	62.71
30.2	34.036	21.26	23.081	54.70	32.653	67.89	18.82	62.25
Feb. 9.2	33.895	20.73	22.925	53.86	32.408	67.21	18.42	61.23
19.2	33.757	20.29	22.777	52.96	32.177	66.03	18.05	59.68
Mar. 1.1	33.633	19.98	22.642	52.00	31.966	64.41	17.70	57.65
11.1	33.529	19.84	22.527	51.08	31.786	62.38	17.41	55.18
21.1	33.453	19.88	22.446	50.23	31.645	59.98	17.17	52.31
31.1	33.410	20.11	22.399	49.48	31.547	57.27	16.98	49.17
Apr. 10.0	33.408	20.57	22.396	48.87	31.501	54.31	16.88	45.78
20.0	33.447	21.26	22.442	48.49	31.509	51.16	16.85	42.20
30.0	33.532	22.17	22.534	48.36	31.576	47.87	16.90	38.59
May 9.9	33.661	23.32	22.673	48.47	31.700	44.54	17.03	34.96
19.9	33.832	24.65	22.854	48.87	31.882	41.22	17.24	31.39
29.9	34.040	26.21	23.079	49.53	32.116	38.00	17.52	28.00
June 8.9	34.281	27.90	23.338	50.46	32.397	34.96	17.87	24.83
18.8	34.550	29.70	23.625	51.60	32.717	32.16	18.28	22.00
28.8	34.837	31.56	23.930	52.98	33.070	29.68	18.73	19.54
July 8.8	35.136	33.45	24.245	54.53	33.444	27.58	19.23	17.54
18.8	35.438	35.29	24.564	56.23	33.830	25.92	19.74	16.03
28.7	35.735	37.05	24.878	58.00	34.218	24.76	20.27	15.08
Aug. 7.7	36.023	38.67	25.180	59.80	34.596	24.10	20.78	14.72
17.7	36.292	40.13	25.463	61.59	34.956	24.00	21.28	14.94
27.6	36.540	41.36	25.726	63.33	35.288	24.43	21.74	15.76
Sept. 6.6	36.761	42.35	25.959	64.99	35.582	25.41	22.15	17.13
16.6	36.954	43.10	26.163	66.52	35.834	26.86	22.51	19.01
26.6	37.114	43.58	26.332	67.93	36.040	28.75	22.79	21.35
Oct. 6.5	37.245	43.83	26.473	69.16	36.194	30.99	23.00	24.01
16.5	37.341	43.84	26.581	70.22	36.296	33.52	23.14	26.97
26.5	37.409	43.64	26.656	71.12	36.345	36.21	23.19	30.07
Nov. 5.5	37.447	43.27	26.699	71.82	36.344	38.97	23.16	33.19
15.4	37.458	42.77	26.715	72.33	36.294	41.69	23.05	36.21
25.4	37.439	42.15	26.699	72.69	36.200	44.26	22.88	39.03
Dec. 5.4	37.397	41.45	26.657	72.86	36.066	46.57	22.64	41.52
15.3	37.330	40.72	26.585	72.85	35.897	48.57	22.35	43.60
25.3	37.243	39.97	26.491	72.67	35.701	50.14	22.01	45.19
35.3	37.135	39.23	26.376	72.36	35.480	51.26	21.64	46.23
Mean Place	34.048	28.70	22.913	56.01	33.420	46.91	20.135	39.10
Sec δ , Tan δ	1.001	+0.049	1.067	+0.373	1.458	-1.060	2.126	-1.876
$D\psi\alpha$, $D\omega\alpha$	+0.062	-0.003	+0.066	-0.022	+0.048	+0.063	+0.037	+0.109
$D\psi\delta$, $D\omega\delta$	+0.35	+0.46	+0.35	+0.46	+0.35	+0.46	+0.35	+0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	<i>v</i> Ceti. Mag. 4.2		50 Cassiopeiæ. Mag. 4.1		<i>γ</i> Andromedæ pr. Mag. 2.3		<i>α</i> Arietis. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 1 56	° ' -21 26	h m 1 56	° ' +72 2	h m 1 59	° ' +41 57	h m 2 2	° ' +23 5
	s	"	s	"	s	"	s	"
Jan. 0.3	22.778	74.55	52.61	71.21	10.968	45.97	50.391	57.29
10.3	22.638	75.51	52.05	72.13	10.788	46.11	50.262	56.95
20.3	22.487	76.17	51.44	72.49	10.589	45.86	50.115	56.43
30.2	22.326	76.52	50.82	72.25	10.377	45.25	49.959	55.78
Feb. 9.2	22.165	76.52	50.19	71.42	10.161	44.31	49.795	54.98
19.2	22.008	76.21	49.60	70.08	9.950	43.09	49.635	54.08
Mar. 1.1	21.865	75.56	49.06	68.22	9.758	41.62	49.489	53.11
11.1	21.744	74.60	48.61	66.00	9.597	39.96	49.364	52.12
21.1	21.648	73.32	48.25	63.44	9.473	38.22	49.270	51.15
31.1	21.588	71.78	48.02	60.70	9.398	36.44	49.210	50.29
Apr. 10.0	21.567	69.97	47.92	57.89	9.376	34.72	49.197	49.57
20.0	21.590	67.92	47.95	55.06	9.415	33.13	49.227	49.00
30.0	21.658	65.68	48.12	52.39	9.513	31.76	49.308	48.68
May 10.0	21.775	63.26	48.43	49.95	9.668	30.63	49.439	48.60
19.9	21.933	60.74	48.85	47.80	9.881	29.82	49.612	48.79
29.9	22.134	58.18	49.39	46.06	10.144	29.32	49.832	49.25
June 8.9	22.371	55.62	50.02	44.72	10.446	29.20	50.087	49.99
18.8	22.638	53.15	50.72	43.88	10.785	29.44	50.371	50.97
28.8	22.928	50.80	51.48	43.52	11.146	30.08	50.673	52.20
July 8.8	23.233	48.65	52.27	43.67	11.523	31.00	50.991	53.60
18.8	23.546	46.75	53.07	44.28	11.907	32.27	51.316	55.19
28.7	23.857	45.16	53.87	45.42	12.285	33.82	51.637	56.88
Aug. 7.7	24.159	43.94	54.64	47.00	12.650	35.61	51.947	58.62
17.7	24.445	43.09	55.38	48.99	12.998	37.60	52.239	60.40
27.7	24.710	42.64	56.06	51.35	13.320	39.72	52.514	62.15
Sept. 6.6	24.946	42.63	56.68	54.02	13.608	41.96	52.760	63.85
16.6	25.153	43.01	57.22	56.96	13.863	44.25	52.977	65.44
26.6	25.324	43.77	57.68	60.10	14.082	46.57	53.164	66.94
Oct. 6.5	25.464	44.87	58.04	63.43	14.262	48.86	53.320	68.28
16.5	25.564	46.26	58.31	66.82	14.403	51.08	53.444	69.46
26.5	25.631	47.86	58.48	70.19	14.503	53.19	53.534	70.47
Nov. 5.5	25.663	49.61	58.54	73.51	14.563	55.16	53.592	71.34
15.4	25.663	51.42	58.50	76.68	14.583	56.94	53.621	72.01
25.4	25.633	53.23	58.34	79.63	14.561	58.50	53.617	72.53
Dec. 5.4	25.575	54.94	58.08	82.28	14.503	59.81	53.584	72.85
15.4	25.490	56.53	57.72	84.53	14.410	60.83	53.520	73.02
25.3	25.382	57.88	57.28	86.32	14.278	61.53	53.432	72.98
35.3	25.254	58.99	56.75	87.59	14.117	61.88	53.319	72.75
Mean Place	22.572	61.05	49.450	58.67	9.903	39.58	49.691	56.58
Sec δ , Tan δ	1.074	-0.393	3.245	+3.087	1.345	+0.899	1.087	+0.426
$D\psi\alpha$, $D\omega\alpha$	+0.056	+0.023	+0.101	-0.180	+0.073	-0.052	+0.067	-0.024
$D\psi\delta$, $D\omega\delta$	+0.35	+0.49	+0.35	+0.49	+0.35	+0.50	+0.34	+0.51

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Trianguli. Mag. 3.1		δ Cassiopeiæ. Mag. 6.2		ϵ Persei. Mag. 5.4		ξ^1 Ceti. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 4	° ' +34 37	h m 2 8	° ' +66 9	h m 2 8	° ' +50 42	h m 2 8	° ' + 8 29
	s	"	s	"	s	"	s	"
Jan. 0.3	58.266	29.67	27.45	63.14	29.834	40.16	55.518	5.52
10.3	58.116 150	29.64 3	27.06 39	64.04 90	29.617 217	40.61 45	55.403 115	4.89 63
20.3	57.943 173	29.30 34	26.63 43	64.40 36	29.373 244	40.62 1	55.272 131	4.25 64
30.2	57.760 183	28.71 59	26.17 46	64.22 18	29.110 263	40.21 41	55.129 143	3.61 64
Feb. 9.2	57.567 193	27.85 86	25.71 46	63.50 72	28.842 268	39.37 84	54.980 149	3.00 61
	185	110	45	125	261	121	147	56
19.2	57.382	26.75	25.26	62.25	28.581	38.16	54.833	2.44
Mar. 1.1	57.209 173	25.50 125	24.85 41	60.56 169	28.338 243	36.61 155	54.695 138	1.95 49
11.1	57.065 144	24.10 140	24.49 36	58.49 207	28.130 208	34.81 180	54.576 119	1.57 38
21.1	56.951 114	22.67 143	24.21 28	56.13 236	27.967 163	32.82 199	54.482 94	1.33 24
31.1	56.880 71	21.24 143	24.02 19	53.58 255	27.859 108	30.73 209	54.422 60	1.24 9
	22	134	9	265	43	210	20	10
Apr. 10.0	56.858	19.90	23.93	50.93	27.816	28.63	54.402	1.34
20.0	56.888 30	18.69 121	23.94 1	48.32 261	27.840 24	26.61 202	54.424 22	1.66 32
30.0	56.973 85	17.69 100	24.06 12	45.82 250	27.935 95	24.76 185	54.492 68	2.20 54
May 10.0	57.114 141	16.94 75	24.28 22	43.53 229	28.099 164	23.15 161	54.606 114	2.99 79
19.9	57.302 188	16.48 46	24.60 32	41.54 199	28.328 289	21.84 131	54.763 157	3.98 99
	237	13	41	164	288	98	197	122
29.9	57.539	16.35	25.01	39.90	28.616	20.86	54.960	5.20
June 8.9	57.818 279	16.54 19	25.49 48	38.69 121	28.954 338	20.28 58	55.192 232	6.60 140
18.8	58.124 306	17.04 50	26.04 55	37.90 79	29.332 378	20.09 19	55.454 262	8.15 155
28.8	58.457 333	17.86 82	26.63 59	37.58 32	29.741 409	20.30 21	55.737 283	9.82 167
July 8.8	58.805 318	18.95 109	27.25 62	37.73 15	30.168 427	20.90 60	56.034 297	11.54 172
	352	135	63	62	437	98	303	176
18.8	59.157	20.30	27.88	38.35	30.605	21.88	56.337	13.30
28.7	59.508 351	21.89 159	28.52 64	39.43 108	31.039 434	23.21 133	56.638 301	15.02 172
Aug. 7.7	59.847 339	23.64 175	29.14 62	40.93 150	31.461 422	24.86 165	56.932 294	16.66 161
17.7	60.172 325	25.54 190	29.73 59	42.79 186	31.863 402	26.77 191	57.212 280	18.19 153
27.7	60.470 298	27.49 195	30.28 55	45.03 224	32.238 375	28.92 215	57.471 259	19.57 138
	273	201	51	251	342	232	236	118
Sept. 6.6	60.743	29.50	30.79	47.54	32.580	31.24	57.707	20.75
16.6	60.982 239	31.53 203	31.24 45	50.31 277	32.883 303	33.70 246	57.915 208	21.72 97
26.6	61.190 208	33.53 200	31.62 38	53.26 295	33.146 263	36.26 256	58.094 179	22.47 75
Oct. 6.5	61.363 173	35.44 191	31.94 32	56.35 309	33.365 219	38.85 259	58.244 150	23.01 54
16.5	61.501 138	37.27 183	32.18 24	59.51 316	33.538 173	41.41 256	58.363 119	23.32 31
	101	169	18	315	127	252	90	13
26.5	61.602	38.96	32.36	62.66	33.665	43.93	58.453	23.45
Nov. 5.5	61.669 67	40.50 154	32.45 9	65.76 310	33.745 80	46.35 242	58.512 59	23.40 5
15.4	61.697 28	41.88 138	32.46 1	68.73 297	33.775 30	48.60 225	58.542 30	23.19 21
25.4	61.692 5	43.06 118	32.39 7	71.49 276	33.757 18	50.64 204	58.544 2	22.86 33
Dec. 5.4	61.652 40	44.01 95	32.24 15	73.98 249	33.691 66	52.41 177	58.518 26	22.43 43
	74	69	23	212	113	148	52	50
15.4	61.578	44.70	32.01	76.10	33.578	53.89	58.466	21.93
25.3	61.471 107	45.12 42	31.71 30	77.80 170	33.421 157	55.00 111	58.388 78	21.37 56
35.3	61.338 133	45.29 17	31.35 36	79.04 124	33.226 195	55.72 72	58.289 99	20.78 59
Mean Place	57.344	25.60	24.999	52.20	28.414	32.18	54.975	9.78
Sec δ , Tan δ	1.215	+0.690	2.475	+2.264	1.579	+1.222	1.011	+0.149
$D\psi\alpha$, $D\omega\alpha$	+0.071	-0.039	+0.093	-0.128	+0.078	-0.069	+0.063	-0.008
$D\psi\delta$, $D\omega\delta$	+0.34	+0.52	+0.34	+0.53	+0.34	+0.53	+0.34	+0.53

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Fornacis. Mag. 5.2		γ Trianguli. Mag. 4.1		67 Ceti. Mag. 5.7		ϕ Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 9 s	° ' -31 4 "	h m 2 12 s	° ' +33 29 "	h m 2 13 s	° ' - 6 46 "	h m 2 13 s	° ' -51 51 "
Jan. 0.3	30.965 ¹⁶⁰	82.10 ¹⁰⁸	44.788 ¹⁴³	33.94 ¹	8.902 ¹¹⁹	44.47 ⁹¹	45.568 ²⁶⁸	86.94 ¹⁰⁶
10.3	30.805 ¹⁷⁶	83.18 ⁶⁹	44.645 ¹⁶⁷	33.93 ²⁹	8.783 ¹³³	45.38 ⁷⁸	45.300 ²⁸⁵	88.00 ⁵²
20.3	30.629 ¹⁸⁶	83.87 ²⁸	44.478 ¹⁸¹	33.64 ⁵⁴	8.650 ¹⁴⁶	46.16 ⁵⁷	45.015 ²⁹⁵	88.52 ³
30.2	30.443 ¹⁸⁹	84.15 ¹²	44.297 ¹⁸⁸	33.10 ⁸⁰	8.504 ¹⁴⁹	46.73 ³⁹	44.720 ²⁹⁵	88.49 ⁵⁶
Feb. 9.2	30.254 ¹⁸⁴	84.03 ⁵⁴	44.109 ¹⁸⁷	32.30 ¹⁰¹	8.354 ¹⁴⁹	47.12 ¹⁷	44.425 ²⁸⁶	87.93 ¹⁰⁸
19.2	30.070 ¹⁷¹	83.49 ⁹²	43.922 ¹⁷⁵	31.29 ¹¹⁹	8.205 ¹⁴¹	47.29 ⁵	44.139 ²⁶⁵	86.85 ¹⁵⁷
Mar. 1.2	29.899 ¹⁵²	82.57 ¹²⁹	43.747 ¹⁵¹	30.10 ¹³⁰	8.064 ¹²²	47.24 ²⁴	43.874 ²³⁸	85.28 ²⁰¹
11.1	29.747 ¹²¹	81.28 ¹⁶⁷	43.596 ¹¹⁹	28.80 ¹³⁶	7.942 ⁹⁷	47.00 ⁵²	43.636 ¹⁹⁸	83.27 ²⁴¹
21.1	29.626 ⁸⁸	79.61 ¹⁹⁶	43.477 ⁷⁸	27.44 ¹³⁵	7.845 ⁶⁹	46.48 ⁷³	43.438 ¹⁵²	80.86 ²⁷⁵
31.1	29.538 ⁴⁶	77.65 ²²⁵	43.399 ³¹	26.09 ¹²⁸	7.776 ²⁸	45.75 ⁹⁸	43.286 ⁹⁶	78.11 ³⁰⁴
Apr. 10.0	29.492 ⁰	75.40 ²⁵⁰	43.368 ²¹	24.81 ¹¹⁴	7.748 ¹³	44.77 ¹²³	43.190 ³⁷	75.07 ³²⁵
20.0	29.492 ⁵¹	72.90 ²⁶⁸	43.389 ⁷⁵	23.67 ⁹⁶	7.761 ⁵⁸	43.54 ¹⁴⁴	43.153 ²⁵	71.82 ³³⁹
30.0	29.543 ⁹⁸	70.22 ²⁸²	43.464 ¹³⁰	22.71 ⁷¹	7.819 ¹⁰¹	42.10 ¹⁶¹	43.178 ⁹¹	68.43 ³⁴⁷
May 10.0	29.641 ¹⁴⁸	67.40 ²⁸⁹	43.594 ¹⁸¹	22.00 ⁴³	7.920 ¹⁴⁷	40.49 ¹⁸²	43.269 ¹⁵⁴	64.96 ³³⁹
19.9	29.789 ¹⁹⁰	64.51 ²⁹⁰	43.775 ²²⁸	21.57 ¹²	8.067 ¹⁸⁷	38.67 ¹⁹⁷	43.423 ²¹⁴	61.49 ³³⁹
29.9	29.979 ²³⁴	61.61 ²⁸³	44.003 ²⁶⁹	21.45 ¹⁹	8.254 ²²¹	36.70 ²⁰²	43.637 ²⁷¹	58.10 ³²²
June 8.9	30.213 ²⁶⁷	58.78 ²⁷⁴	44.272 ³⁰²	21.64 ⁴⁹	8.475 ²⁵⁰	34.68 ²⁰⁹	43.908 ³¹⁷	54.88 ²⁹⁷
18.9	30.480 ²⁹⁶	56.04 ²⁵³	44.574 ³²⁶	22.13 ⁸⁰	8.725 ²⁷⁴	32.59 ²¹⁰	44.225 ³⁵⁹	51.91 ²⁶⁶
28.8	30.776 ³¹⁴	53.51 ²²⁵	44.900 ³⁴¹	22.93 ¹⁰⁸	8.999 ²⁹⁰	30.49 ²⁰²	44.584 ³⁸⁹	49.25 ²²⁷
July 8.8	31.090 ³²⁵	51.26 ¹⁹⁴	45.241 ³⁴⁹	24.01 ¹³¹	9.289 ²⁹⁹	28.47 ¹⁹⁰	44.973 ⁴⁰⁹	46.98 ¹⁸¹
18.8	31.415 ³²⁸	49.32 ¹⁵⁶	45.590 ³⁴⁷	25.32 ¹⁵²	9.588 ²⁹⁸	26.57 ¹⁷¹	45.382 ⁴¹⁷	45.17 ¹³²
28.7	31.743 ³²³	47.76 ¹¹³	45.937 ³³⁹	26.84 ¹⁷⁰	9.886 ²⁹¹	24.86 ¹⁵¹	45.799 ⁴¹⁵	43.85 ⁷⁷
Aug. 7.7	32.066 ³⁰⁹	46.63 ⁶⁸	46.276 ³²²	28.54 ¹⁸¹	10.177 ²⁷⁸	23.35 ¹²²	46.214 ⁴⁰⁰	43.08 ²²
17.7	32.375 ²⁸⁸	45.95 ²⁰	46.598 ³⁰⁰	30.35 ¹⁸⁹	10.455 ²⁶²	22.13 ⁹⁵	46.614 ³⁷⁷	42.86 ³⁷
27.7	32.663 ²⁶⁰	45.75 ²⁸	46.898 ²⁷⁵	32.24 ¹⁹³	10.717 ²³⁷	21.18 ⁶¹	46.991 ³⁴²	43.23 ⁹³
Sept. 6.6	32.923 ²²⁹	46.03 ⁷⁴	47.173 ²⁴⁴	34.17 ¹⁹⁴	10.954 ²¹⁰	20.54 ²⁹	47.333 ³⁰¹	44.16 ¹⁴⁶
16.6	33.152 ¹⁹⁵	46.77 ¹¹⁸	47.417 ²¹³	36.11 ¹⁸⁹	11.164 ¹⁸²	20.25 ¹	47.634 ²⁵¹	45.62 ¹⁹⁴
26.6	33.347 ¹⁵⁶	47.95 ¹⁵⁵	47.630 ¹⁷⁸	38.00 ¹⁸³	11.346 ¹⁵¹	20.26 ³¹	47.885 ¹⁹⁸	47.56 ²³³
Oct. 6.6	33.503 ¹¹⁷	49.50 ¹⁸⁵	47.808 ¹⁴⁵	39.83 ¹⁶¹	11.497 ⁸⁷	20.57 ⁸²	48.083 ¹⁴⁰	49.89 ²⁶⁵
16.5	33.620 ⁷⁸	51.35 ²⁰⁹	47.953 ¹¹⁰	41.56 ¹⁷³	11.618 ¹²¹	21.14 ⁵⁷	48.223 ⁸³	52.54 ²⁸⁶
26.5	33.698 ⁴¹	53.44 ²²²	48.063 ⁷⁴	43.17 ¹⁴⁷	11.705 ⁵⁷	21.96 ⁹⁷	48.306 ²⁴	55.40 ²⁹⁶
Nov. 5.5	33.739 ¹	55.66 ²²⁸	48.137 ³⁹	44.64 ¹³¹	11.762 ²⁷	22.93 ¹¹⁰	48.330 ³²	58.36 ²⁹⁵
15.4	33.740 ³²	57.94 ²²³	48.176 ⁵	45.95 ¹¹¹	11.789 ¹	24.03 ¹¹⁹	48.298 ⁸⁶	61.31 ²⁸²
25.4	33.708 ⁶⁷	60.17 ²¹²	48.181 ³⁰	47.06 ⁹¹	11.788 ⁵⁷	25.22 ¹¹⁶	48.212 ¹³⁶	64.13 ²⁵⁷
Dec. 5.4	33.641 ⁹⁶	62.29 ¹⁹⁰	48.151 ⁶⁶	47.97 ⁶⁷	11.761 ²⁷	26.41 ¹¹⁶	48.076 ¹⁹⁰	66.70 ²²³
15.4	33.545 ¹²³	64.19 ¹⁶²	48.085 ⁹⁷	48.64 ⁴⁴	11.704 ⁸²	27.57 ¹⁰⁸	47.896 ²¹⁸	68.93 ¹⁸²
25.3	33.422 ¹⁴⁷	65.81 ¹²⁸	47.988 ¹²⁶	49.08 ¹⁷	11.622 ¹⁰⁴	28.65 ⁹⁷	47.678 ²⁴⁹	70.75 ¹⁸⁶
35.3	33.275	67.09	47.862	49.25	11.518	29.62	47.429	72.11
Mean Place	30.733	65.56	43.849	30.62	8.479	35.11	45.401	65.66
Sec δ , Tan δ	1.168	-0.603	1.199	+0.662	1.007	-0.119	1.620	-1.274
$D\psi\alpha$, $D\omega\alpha$	+0.053	+0.034	+0.071	-0.037	+0.059	+0.007	+0.043	+0.071
$D\psi\delta$, $D\omega\delta$	+0.34	+0.54	+0.33	+0.55	+0.33	+0.55	+0.33	+0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Ceti. (Mira.) Var. 1.7-9.6		κ Fornacis. Mag. 5.4		δ Hydri. Mag. 4.3		ϵ Cassiopeiæ. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 15	° ' - 3 19	h m 2 19	° ' -24 9	h m 2 20	° ' -69 0	h m 2 22	° ' +67 3
	s "	"	s "	"	s "	"	s "	"
Jan. 0.3	27.791 115	43.61 86	1.452 139	71.69 111	22.64 54	57.59 93	44.67 40	36.43 109
10.3	27.676 132	44.47 75	1.313 157	72.80 80	22.10 56	58.52 33	44.27 44	37.52 56
20.3	27.544 143	45.22 60	1.156 170	73.60 45	21.54 58	58.85 27	43.83 48	38.08 1
30.2	27.401 150	45.82 44	0.986 174	74.05 9	20.96 57	58.58 85	43.35 48	38.09 53
Feb. 9.2	27.251 149	46.26 29	0.812 173	74.14 28	20.39 56	57.73 142	42.87 48	37.56 105
19.2	27.102 141	46.55 8	0.639 162	73.86 62	19.83 51	56.31 193	42.39 44	36.51 153
Mar. 1.2	26.961 122	46.63 11	0.477 146	73.24 96	19.32 46	54.38 239	41.95 39	34.98 193
11.1	26.839 100	46.52 32	0.331 119	72.28 130	18.86 40	51.99 278	41.56 32	33.05 226
21.1	26.739 67	46.20 55	0.212 86	70.98 161	18.46 33	49.21 313	41.24 23	30.79 218
31.1	26.672 30	45.65 77	0.126 49	69.37 188	18.13 22	46.08 338	41.01 13	28.31 262
Apr. 10.0	26.642 12	44.88 102	0.077 3	67.49 213	17.91 13	42.70 357	40.88 2	25.69 263
20.0	26.654 56	43.86 124	0.074 42	65.36 234	17.78 3	39.13 368	40.86 9	23.06 254
30.0	26.710 103	42.62 112	0.116 90	63.02 251	17.75 6	35.45 370	40.95 19	20.52 237
May 10.0	26.813 144	41.20 162	0.206 137	60.51 263	17.81 18	31.75 366	41.14 30	18.15 211
19.9	26.957 186	39.58 179	0.343 181	57.88 268	17.99 28	28.09 350	41.44 39	16.04 177
29.9	27.143 221	37.79 190	0.524 220	55.20 267	18.27 37	24.59 329	41.83 48	14.27 139
June 8.9	27.364 250	35.89 197	0.744 254	52.53 260	18.64 45	21.30 299	42.31 55	12.88 98
18.9	27.614 274	33.92 200	0.998 281	49.93 217	19.09 53	18.31 261	42.86 59	11.90 51
28.8	27.888 289	31.92 195	1.279 300	47.46 226	19.62 58	15.70 216	43.45 64	11.39 5
July 8.8	28.177 298	29.97 186	1.579 310	45.20 199	20.20 62	13.54 166	44.09 65	11.34 41
18.8	28.475 299	28.11 172	1.889 315	43.21 167	20.82 65	11.88 110	44.74 66	11.75 87
28.7	28.774 291	26.39 155	2.204 308	41.54 129	21.47 66	10.78 51	45.40 65	12.62 129
Aug. 7.7	29.065 277	24.84 130	2.512 297	40.25 90	22.13 65	10.27 8	46.05 62	13.91 169
17.7	29.342 261	23.54 104	2.809 279	39.35 45	22.78 60	10.35 70	46.67 59	15.60 205
27.7	29.603 237	22.50 75	3.088 255	38.90 2	23.38 55	11.05 129	47.26 55	17.65 236
Sept. 6.6	29.840 213	21.75 45	3.343 227	38.88 43	23.93 50	12.34 183	47.81 49	20.01 263
16.6	30.053 181	21.30 16	3.570 194	39.31 83	24.43 41	14.17 231	48.30 43	22.64 284
26.6	30.234 152	21.14 14	3.764 160	40.14 120	24.84 31	16.48 272	48.73 36	25.48 302
Oct. 6.6	30.386 121	21.28 38	3.924 125	41.34 152	25.15 21	19.20 301	49.09 30	28.50 310
16.5	30.507 92	21.66 61	4.049 91	42.86 176	25.36 11	22.21 319	49.39 21	31.60 314
26.5	30.599 61	22.27 78	4.140 54	44.62 193	25.47 0	25.40 326	49.60 13	34.74 312
Nov. 5.5	30.660 32	23.05 91	4.194 20	46.55 201	25.47 12	28.66 319	49.74 4	37.86 300
15.4	30.692 1	23.96 100	4.214 13	48.56 201	25.35 20	31.85 301	49.78 4	40.86 285
25.4	30.693 25	24.96 104	4.201 43	50.57 193	25.15 30	34.86 270	49.74 12	43.71 258
Dec. 5.4	30.668 53	26.00 103	4.158 74	52.50 178	24.85 39	37.56 230	49.62 21	46.29 227
15.4	30.615 78	27.03 98	4.084 101	54.28 155	24.46 45	39.86 181	49.41 28	48.56 187
25.3	30.537 99	28.01 92	3.983 126	55.83 130	24.01 50	41.67 126	49.13 35	50.43 142
35.3	30.438	28.93	3.857	57.13	23.51	42.93	48.78	51.85
Mean Place	27.327	35.28	1.114	56.90	22.376	33.94	41.967	26.34
Sec δ , Tan δ	1.002	-0.058	1.096	-0.449	2.792	-2.606	2.565	+2.362
$D\psi\alpha$, $D\alpha\alpha$	+0.060	+0.003	+0.054	+0.025	+0.021	+0.142	+0.098	-0.128
$D\psi\delta$, $D\alpha\delta$	+0.33	+0.56	+0.33	+0.57	+0.33	+0.57	+0.32	+0.58

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Ceti. Mag. 4.3		σ Ceti. Mag. 4.8		36 H. Cassiopeiæ. Mag. 5.3		ν Ceti. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 24 s	° ' " + 8 6 "	h m 2 28 s	° ' " -15 34 "	h m 2 30 s	° ' " +72 28 "	h m 2 31 s	° ' " + 5 15 "
Jan. 0.3	4.356	51.49	26.614	66.59	44.19	68.33	50.468	22.97
10.3	4.245	50.86	26.491	67.68	43.66	69.67	50.361	22.27
20.3	4.115	50.22	26.351	68.52	43.07	70.47	50.235	21.61
30.2	3.971	49.61	26.196	69.10	42.44	70.69	50.092	20.99
Feb. 9.2	3.819	49.03	26.032	69.38	41.79	70.34	49.940	20.44
19.2	3.666	48.50	25.869	69.39	41.14	69.41	49.785	19.98
Mar. 1.2	3.522	48.06	25.712	69.10	40.54	67.98	49.636	19.62
11.1	3.393	47.70	25.571	68.51	40.00	66.09	49.502	19.39
21.1	3.288	47.48	25.453	67.64	39.56	63.82	49.391	19.31
31.1	3.213	47.45	25.368	66.48	39.23	61.26	49.311	19.39
Apr. 10.1	3.179	47.57	25.318	65.06	39.02	58.56	49.268	19.68
20.0	3.186	47.89	25.310	63.39	38.95	55.78	49.268	20.16
30.0	3.241	48.45	25.347	61.50	39.03	53.06	49.311	20.87
May 10.0	3.339	49.20	25.430	59.40	39.24	50.47	49.401	21.79
19.9	3.483	50.20	25.558	57.18	39.58	48.12	49.535	22.92
29.9	3.668	51.37	25.729	54.84	40.05	46.08	49.711	24.23
June 8.9	3.888	52.74	25.939	52.45	40.63	44.41	49.925	25.72
18.9	4.140	54.27	26.180	50.08	41.29	43.17	50.170	27.34
28.8	4.416	55.89	26.446	47.77	42.03	42.37	50.439	29.04
July 8.8	4.709	57.59	26.736	45.59	42.82	42.07	50.726	30.80
18.8	5.009	59.30	27.034	43.60	43.64	42.22	51.023	32.54
28.8	5.311	61.00	27.335	41.86	44.47	42.87	51.322	34.22
Aug. 7.7	5.606	62.60	27.634	40.43	45.29	43.97	51.617	35.80
17.7	5.890	64.10	27.922	39.33	46.10	45.50	51.902	37.24
27.7	6.156	65.40	28.194	38.60	46.86	47.44	52.169	38.48
Sept. 6.6	6.404	66.54	28.443	38.26	47.57	49.72	52.417	39.51
16.6	6.622	67.48	28.667	38.31	48.21	52.32	52.640	40.31
26.6	6.815	68.20	28.861	38.72	48.78	55.18	52.838	40.87
Oct. 6.6	6.980	68.67	29.026	39.49	49.27	58.25	53.006	41.18
16.5	7.114	68.96	29.158	40.57	49.66	61.43	53.147	41.28
26.5	7.219	69.02	29.259	41.89	49.95	64.72	53.257	41.17
Nov. 5.5	7.296	68.92	29.327	43.38	50.13	68.00	53.339	40.87
15.5	7.340	68.66	29.363	45.01	50.20	71.24	53.391	40.44
25.4	7.357	68.32	29.369	46.67	50.16	74.32	53.413	39.90
Dec. 5.4	7.342	67.86	29.344	48.29	50.00	77.16	53.405	39.27
15.4	7.301	67.32	29.289	49.84	49.72	79.68	53.370	38.60
25.3	7.231	66.74	29.209	51.24	49.34	81.83	53.306	37.91
35.3	7.137	66.12	29.103	52.43	48.87	83.51	53.217	37.24
Mean Place	3.739	56.48	26.166	54.11	40.520	58.09	49.840	29.13
Sec δ , Tan δ	1.010	+0.143	1.038	-0.279	3.322	+3.168	1.004	+0.092
$D\psi\alpha$, $D\omega\alpha$	+0.063	-0.008	+0.057	+0.015	+0.112	-0.167	+0.063	-0.005
$D\psi\delta$, $D\omega\delta$	+0.32	+0.59	+0.32	+0.60	+0.32	+0.61	+0.31	+0.62

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Hydr. Mag. 5.3		ν Arietis. Mag. 5.4		δ Ceti. Mag. 4.0		ϵ Hydr. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 33	° ' " -79 26	h m 2 34	° ' " +21 37	h m 2 35	° ' " 0 0	h m 2 38	° ' " -68 35
	s	"	s	"	s	"	s	"
Jan. 0.3	16.64	68.22	27.264	43.93	32.646	-17.99	24.56	71.51
10.3	15.50 ¹¹⁴	69.13 ⁹¹	27.150 ¹¹⁴	43.68 ²⁵	32.539 ¹⁰⁷	18.79 ⁸⁰	24.04 ⁵²	72.70 ¹¹⁹
20.3	14.30 ¹²⁰	69.46 ³³	27.013 ¹³⁷	43.31 ³⁷	32.412 ¹²⁷	19.55 ⁷⁶	23.49 ⁵⁵	73.31 ⁶¹
30.2	13.07 ¹²³	69.20 ²⁶	26.857 ¹⁵⁶	42.79 ⁵²	32.269 ¹⁴³	20.17 ⁶²	22.92 ⁵⁷	73.30 ¹
Feb. 9.2	11.85 ¹²²	68.31 ⁸⁹	26.691 ¹⁶⁶	42.16 ⁶³	32.115 ¹⁵⁴	20.68 ⁵¹	22.34 ⁵⁸	72.72 ⁵⁸
	118	144	169	71	155	36	56	116
19.2	10.67	66.87	26.522	41.45	31.960	-21.04	21.78	71.56
Mar. 1.2	9.57 ¹¹⁰	64.92 ¹⁹⁵	26.359 ¹⁶³	40.67 ⁷⁸	31.811 ¹⁴⁹	21.24 ²⁰	21.24 ⁵⁴	69.87 ¹⁶⁹
11.1	8.56 ¹⁰¹	62.52 ²⁴⁰	26.213 ¹⁴⁶	39.86 ⁸¹	31.674 ¹³⁷	21.26 ²	20.75 ⁴⁹	67.70 ²¹⁷
21.1	7.68 ⁷⁸	59.72 ³¹⁶	26.092 ¹²¹	39.06 ⁸⁰	31.561 ¹¹³	21.13 ¹³	20.32 ⁴³	65.10 ²⁶⁰
31.1	6.95 ⁷³	56.56 ³⁴⁰	26.004 ⁸⁸	38.33 ⁷³	31.479 ⁸²	20.75 ³⁸	19.97 ³⁵	62.14 ²⁹⁶
	56		47	61	49	58	28	325
Apr. 10.1	6.39	53.16	25.957	37.72	31.430	-20.17	19.69	58.89
20.0	5.98 ⁴¹	49.59 ³⁵⁷	25.956 ¹	37.24 ⁴⁸	31.424 ⁶	19.40 ⁷⁷	19.52 ¹⁷	55.41 ³⁴⁸
30.0	5.78 ²⁰	45.91 ³⁶⁸	26.005 ⁴⁹	36.96 ²⁸	31.462 ³⁸	18.38 ¹⁰²	19.44 ⁸	51.79 ³⁶²
May 10.0	5.78 ⁰	42.22 ³⁶⁹	26.102 ⁹⁷	36.90 ⁶	31.545 ⁸³	17.13 ¹²⁵	19.46 ²	48.10 ³⁶⁷
19.9	5.97 ¹⁹	38.57 ³⁶⁵	26.246 ¹¹⁴	37.08 ¹⁸	31.674 ¹²⁹	15.75 ¹³⁸	19.58 ¹²	44.42 ³⁶⁸
	38	317	188	42	171	159	22	356
29.9	6.35	35.10	26.434	37.50	31.845	-14.16	19.80	40.86
June 8.9	6.92 ⁵⁷	31.84 ³²⁶	26.663 ²²⁹	38.16 ⁶⁶	32.052 ²⁰⁷	12.42 ¹⁷⁴	20.13 ³³	37.47 ³³⁹
18.9	7.65 ⁷³	28.88 ²⁹⁶	26.925 ²⁶²	39.05 ⁸⁹	32.290 ²³⁸	10.61 ¹⁸¹	20.54 ⁴¹	34.36 ³¹¹
28.8	8.53 ⁸⁸	26.30 ²⁵⁸	27.213 ²⁸⁸	40.14 ¹⁰⁹	32.554 ²⁶⁴	8.75 ¹⁸⁶	21.03 ⁴⁹	31.58 ²⁷⁸
July 8.8	9.54 ¹⁰¹	24.17 ²¹³	27.518 ³⁰⁵	41.41 ¹²⁷	32.837 ²⁸³	6.87 ¹⁸⁸	21.58 ⁵⁵	29.22 ²³⁶
	111	158	317	140	294	185	59	185
18.8	10.65	22.59	27.835	42.81	33.131	- 5.02	22.17	27.37
28.8	11.82 ¹¹⁷	21.51 ¹⁰⁸	28.153 ³¹⁸	44.33 ¹⁵²	33.428 ²⁹⁷	3.34 ¹⁶⁸	22.80 ⁶³	26.04 ¹³³
Aug. 7.7	13.02 ¹²⁰	21.03 ⁴⁸	28.468 ³¹⁵	45.90 ¹⁵⁷	33.721 ²⁹³	1.78 ¹⁵⁶	23.44 ⁶¹	25.30 ⁷⁴
17.7	14.21 ¹¹⁹	21.16 ¹³	28.771 ³⁰³	47.49 ¹⁵⁹	34.005 ²⁸⁴	- 0.43 ¹³⁵	24.08 ⁶¹	25.15 ¹⁵
27.7	15.36 ¹¹⁵	21.90 ⁷⁴	29.058 ²⁸⁷	49.05 ¹⁵⁶	34.272 ²⁸⁷	+ 0.70 ¹¹³	24.69 ⁶¹	25.64 ⁴⁹
	107	131	264	149	249	87	57	107
Sept. 6.6	16.43	23.21	29.322	50.54	34.521	+ 1.57	25.26	26.71
16.6	17.38 ⁹⁵	25.06 ¹⁸⁵	29.562 ²⁴⁰	51.95 ¹⁴¹	34.747 ²²⁶	2.16 ⁵⁹	25.78 ⁵²	28.36 ¹⁶⁵
26.6	18.19 ⁸¹	27.42 ²³⁶	29.775 ²¹³	53.24 ¹²⁹	34.946 ¹⁹⁹	2.47 ³¹	26.22 ⁴¹	30.52 ²¹⁶
Oct. 6.6	18.81 ⁶²	30.16 ²⁷⁴	29.960 ¹⁸⁵	54.39 ¹¹⁵	35.116 ¹⁷⁰	2.51 ⁴	26.57 ³⁵	33.11 ²⁵⁹
16.5	19.24 ⁴³	33.21 ³⁰⁵	30.114 ¹⁵⁴	55.40 ¹⁰¹	35.259 ¹⁴³	2.31 ²⁰	26.82 ²⁵	36.05 ²⁹⁴
	21	323	125	87	112	43	15	316
26.5	19.45	36.44	30.239	56.27	35.371	+ 1.88	26.97	39.21
Nov. 5.5	19.44 ¹	39.75 ³³¹	30.332 ⁹³	56.99 ⁷²	35.455 ⁸⁴	1.26 ⁶²	27.01 ⁴	42.49 ³²⁸
15.5	19.22 ²²	42.98 ³²³	30.394 ⁶²	57.55 ⁵⁶	35.508 ⁵³	+ 0.50 ⁷⁶	26.95 ⁶	45.75 ³²⁶
25.4	18.77 ⁴⁵	46.02 ³⁰⁴	30.423 ²⁹	57.98 ⁴³	35.530 ²²	- 0.36 ⁸⁶	26.78 ¹⁷	48.86 ³¹¹
Dec. 5.4	18.14 ⁶³	48.75 ²⁷³	30.420 ³	58.27 ²⁰	35.522 ⁸	1.26 ⁹⁰	26.53 ²⁵	51.72 ²⁸⁶
	82	233	35	14	35	93	35	249
15.4	17.32	51.08	30.385	58.41	35.487	- 2.19	26.18	54.21
25.3	16.36 ⁹⁶	52.91 ¹⁸³	30.319 ⁶⁶	58.41 ⁰	35.423 ⁶⁴	3.10 ⁹¹	25.76 ⁴²	56.25 ²⁰⁴
35.3	15.28 ¹⁰⁸	54.18 ¹²⁷	30.225 ⁹⁴	58.27 ¹⁴	35.334 ⁸⁹	- 3.94 ⁸⁴	25.29 ⁴⁷	57.77 ¹⁵²
Mean Place	15.686	43.99	26.426	45.20	32.048	-10.05	23.955	48.03
Sec δ , Tan δ	5.460	-5.367	1.076	+0.396	1.000	0.000	2.740	-2.551
$D\psi\alpha$, $D\omega\alpha$	-0.027	+0.281	+0.068	-0.021	+0.061	0.000	+0.018	+0.131
$D\psi\delta$, $D\omega\delta$	+0.31	+0.62	+0.31	+0.62	+0.31	+0.63	+0.31	+0.64

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Persei. Mag. 4.2		γ Ceti seq. Mag. 3.7		π Ceti. Mag. 4.4		μ Ceti. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	2 38	+48 54	2 39	+ 2 54	2 40	-14 10	2 40	+ 9 47
	s	"	s	"	s	"	s	"
Jan. 0.3	57.403	19.46	19.158	36.31	27.918	74.86	47.310	18.75
10.3	57.219 ¹⁸⁴	20.11 ⁶⁵	19.055 ¹⁰³	35.55 ⁷⁶	27.802 ¹¹⁶	75.98 ¹¹²	47.208 ¹⁰²	18.18 ⁵⁷
20.3	56.999 ²²⁰	20.39 ²⁸	18.929 ¹²⁶	34.86 ⁶⁹	27.664 ¹³⁸	76.87 ⁸⁹	47.082 ¹²⁶	17.59 ⁵⁹
30.3	56.754 ²⁴⁵	20.26 ¹³	18.787 ¹⁴²	34.23 ⁶³	27.511 ¹⁵³	77.52 ⁶⁵	46.939 ¹⁴³	17.01 ⁵⁸
Feb. 9.2	56.492 ²⁶²	19.76 ⁵⁰	18.633 ¹⁵⁴	33.70 ⁵³	27.346 ¹⁶⁵	77.88 ³⁶	46.784 ¹⁵⁵	16.45 ⁵⁶
	261	89	157	42	167	8	159	54
19.2	56.231	18.87	18.476	33.28	27.179	77.96	46.625	15.91
Mar. 1.2	55.980 ²⁵¹	17.64 ¹²³	18.324 ¹⁵²	33.00 ²⁸	27.017 ¹⁶²	77.76 ²⁰	46.472 ¹⁵³	15.44 ⁴⁷
11.1	55.753 ²²⁷	16.14 ¹⁵⁰	18.184 ¹⁴⁰	32.85 ¹⁵	26.870 ¹⁴⁷	77.26 ⁵⁰	46.331 ¹⁴¹	15.05 ³⁹
21.1	55.566 ¹⁸⁷	14.40 ¹⁷⁴	18.068 ¹¹⁶	32.86 ¹	26.745 ¹²⁵	76.49 ⁷⁷	46.215 ¹¹⁶	14.77 ²⁸
31.1	55.427 ¹³⁹	12.52 ¹⁸⁸	17.981 ⁸⁷	33.07 ²¹	26.649 ⁹⁶	75.44 ¹⁰⁵	46.127 ⁸⁸	14.63 ¹⁴
	80	193	52	39	60	132	51	3
Apr. 10.1	55.347	10.59	17.929	33.46	26.589	74.12	46.076	14.66
20.0	55.328 ¹⁹	8.72 ¹⁸⁷	17.921 ⁸	34.08 ⁶²	26.570 ¹⁹	72.55 ¹⁵⁷	46.069 ⁷	14.88 ²²
30.0	55.379 ⁵¹	6.94 ¹⁷⁸	17.956 ³⁵	34.90 ⁸²	26.595 ²⁵	70.76 ¹⁷⁹	46.106 ³⁷	15.30 ⁴²
May 10.0	55.496 ¹¹⁷	5.32 ¹⁶²	18.037 ⁸¹	35.94 ¹⁰⁴	26.668 ⁷³	68.77 ¹⁹⁹	46.190 ⁸⁴	15.95 ⁶⁵
20.0	55.679 ¹⁸³	3.96 ¹³⁶	18.163 ¹²⁶	37.19 ¹²⁵	26.786 ¹¹⁸	66.61 ²¹⁶	46.321 ¹³¹	16.79 ⁸¹
	246	108	169	142	161	227	172	106
29.9	55.925	2.88	18.332	38.61	26.947	64.34	46.493	17.85
June 8.9	56.222 ²⁹⁷	2.14 ⁷⁴	18.538 ²⁰⁶	40.18 ¹⁵⁷	27.146 ¹⁹⁹	62.00 ²³⁴	46.703 ²¹⁰	19.08 ¹²³
18.9	56.566 ³⁴⁴	1.74 ⁴⁰	18.776 ²³⁸	41.88 ¹⁷⁰	27.380 ²³⁴	59.67 ²³³	46.948 ²⁴⁵	20.47 ¹³⁹
28.8	56.945 ³⁷⁹	1.72 ²	19.041 ²⁶⁵	43.64 ¹⁷⁶	27.640 ²⁶⁰	57.38 ²²⁹	47.216 ²⁶⁸	21.99 ¹⁵²
July 8.8	57.349 ⁴⁰⁴	2.04 ³²	19.323 ²⁸²	45.43 ¹⁷⁹	27.921 ²⁸¹	55.21 ²¹⁷	47.503 ²⁸⁷	23.58 ¹⁵⁹
	418	67	294	176	294	201	300	163
18.8	57.767	2.71	19.617	47.19	28.215	53.20	47.803	25.21
28.8	58.190 ⁴²³	3.73 ¹⁰²	19.914 ²⁹⁷	48.87 ¹⁶⁸	28.515 ³⁰⁰	51.43 ¹⁷⁷	48.105 ³⁰²	26.84 ¹⁶³
Aug. 7.7	58.612 ⁴²²	5.04 ¹³¹	20.208 ²⁹⁴	50.43 ¹⁵⁶	28.812 ²⁹⁷	49.93 ¹⁵⁰	48.405 ³⁰⁰	28.40 ¹⁵⁶
17.7	59.018 ⁴⁰⁶	6.63 ¹⁵⁹	20.493 ²⁸⁵	51.83 ¹⁴⁰	29.102 ²⁹⁰	48.77 ¹¹⁶	48.695 ²⁹⁰	29.87 ¹⁴⁷
27.7	59.406 ³⁸⁸	8.48 ¹⁸⁵	20.763 ²⁷⁰	53.00 ¹¹⁷	29.376 ²⁷⁴	47.96 ⁸¹	48.970 ²⁷⁵	31.19 ¹³²
	362	198	250	96	256	42	255	115
Sept. 6.7	59.768	10.46	21.013	53.96	29.632	47.54	49.225	32.34
16.6	60.099 ³³¹	12.62 ²¹⁶	21.241 ²²⁸	54.65 ⁶⁹	29.863 ²³¹	47.50 ⁴	49.458 ²³³	33.30 ⁹⁶
26.6	60.396 ²⁹⁷	14.89 ²²⁷	21.443 ²⁰²	55.09 ⁴⁴	30.069 ²⁰⁶	47.82 ³²	49.666 ²⁰⁸	34.04 ⁷⁴
Oct. 6.6	60.652 ²⁵⁶	17.23 ²³⁴	21.617 ¹⁷⁴	55.26 ¹⁷	30.242 ¹⁷³	48.51 ⁶⁹	49.846 ¹⁸⁰	34.57 ⁵³
16.5	60.866 ²¹⁴	19.56 ²³³	21.763 ¹⁴⁶	55.21 ⁵	30.387 ¹⁴⁵	49.49 ⁹⁸	49.998 ¹⁵²	34.90 ³³
	172	231	117	28	113	125	122	14
26.5	61.038	21.87	21.880	54.93	30.500	50.74	50.120	35.04
Nov. 5.5	61.167 ¹²⁹	24.15 ²²⁸	21.968 ⁸⁸	54.49 ⁴⁴	30.581 ⁸¹	52.17 ¹⁴³	50.215 ⁹⁵	35.01 ³
15.5	61.247 ⁸⁰	26.32 ²¹⁷	22.025 ⁵⁷	53.90 ⁵⁹	30.630 ⁴⁹	53.75 ¹⁵⁸	50.278 ⁶³	34.84 ¹⁷
25.4	61.278 ³¹	28.34 ²⁰²	22.053 ²⁸	53.19 ⁷¹	30.647 ¹⁷	55.37 ¹⁶²	50.311 ³	34.54 ³⁰
Dec. 5.4	61.260 ¹⁸	30.14 ¹⁸⁰	22.052 ¹	52.43 ⁷⁶	30.634 ¹³	56.99 ¹⁶²	50.313 ²	34.16 ³⁸
	69	156	32	80	44	155	27	46
15.4	61.191	31.70	22.020	51.63	30.590	58.54	50.286	33.70
25.4	61.076 ¹¹⁵	32.94 ¹²⁴	21.959 ⁶¹	50.84 ⁷⁹	30.517 ⁷³	59.95 ¹⁴¹	50.229 ⁵⁷	33.19 ⁵¹
35.3	60.918 ¹⁵⁸	33.86 ⁹²	21.873 ⁸⁶	50.08 ⁷⁶	30.418 ⁹⁹	61.17 ¹²²	50.143 ⁸⁶	32.65 ⁵⁴
Mean Place	55.876	13.79	18.515	43.47	27.392	62.55	46.593	23.86
Sec δ , Tan δ	1.522	+1.147	1.001	+0.051	1.031	-0.253	1.015	+0.172
$D\psi\alpha$, $D\omega\alpha$	+0.081	-0.059	+0.062	-0.003	+0.057	+0.013	+0.064	-0.009
$D\psi\delta$, $D\omega\delta$	+0.31	+0.64	+0.31	+0.64	+0.30	+0.64	+0.30	+0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Persei. Mag. 3.9		δ Arietis. Mag. 3.7		β Fornacis. Mag. 4.5		σ Arietis. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 45 s	° ' " +55 34 "	h m 2 45 s	° ' " +26 56 "	h m 2 45 s	° ' " -32 43 "	h m 2 47 s	° ' " +14 45 "
Jan. 0.3	6.001	44.08	27.762	38.53	52.580	60.80	15.085	51.92
10.3	5.778	45.04	27.648	38.49	52.425	62.19	14.983	51.50
20.3	5.513	45.56	27.506	38.27	52.247	63.18	14.857	51.02
30.3	5.216	45.64	27.343	37.88	52.053	63.75	14.711	50.49
Feb. 9.2	4.902	45.26	27.167	37.30	51.848	63.90	14.552	49.93
19.2	4.584	44.44	26.986	36.60	51.641	63.61	14.388	49.35
Mar. 1.2	4.279	43.22	26.809	35.75	51.440	62.90	14.227	48.77
11.1	4.001	41.65	26.648	34.83	51.256	61.77	14.079	48.23
21.1	3.767	39.82	26.513	33.87	51.095	60.26	13.955	47.76
31.1	3.589	37.78	26.412	32.92	50.968	58.41	13.859	47.38
Apr. 10.1	3.477	35.62	26.350	32.03	50.878	56.24	13.803	47.14
20.0	3.440	33.45	26.338	31.28	50.835	53.79	13.789	47.06
30.0	3.480	31.36	26.377	30.65	50.838	51.12	13.822	47.17
May 10.0	3.598	29.42	26.466	30.25	50.893	48.28	13.902	47.50
20.0	3.793	27.70	26.606	30.07	51.001	45.31	14.029	48.03
29.9	4.057	26.26	26.792	30.16	51.155	42.32	14.200	48.79
June 8.9	4.385	25.16	27.020	30.48	51.355	39.34	14.410	49.75
18.9	4.765	24.43	27.284	31.06	51.593	36.46	14.653	50.90
28.8	5.186	24.08	27.577	31.86	51.866	33.75	14.925	52.20
July 8.8	5.640	24.12	27.890	32.88	52.165	31.29	15.215	53.62
18.8	6.112	24.55	28.214	34.10	52.480	29.13	15.517	55.12
28.8	6.592	25.36	28.544	35.46	52.806	27.35	15.825	56.65
Aug. 7.7	7.070	26.53	28.870	36.92	53.133	25.99	16.128	58.18
17.7	7.536	28.01	29.188	38.46	53.456	25.09	16.424	59.65
27.7	7.980	29.78	29.489	40.03	53.762	24.70	16.706	61.04
Sept. 6.7	8.398	31.81	29.771	41.58	54.047	24.80	16.969	62.30
16.6	8.780	34.03	30.030	43.10	54.307	25.41	17.210	63.41
26.6	9.124	36.42	30.260	44.55	54.535	26.48	17.425	64.36
Oct. 6.6	9.425	38.92	30.464	45.92	54.730	27.98	17.615	65.11
16.5	9.678	41.51	30.636	47.17	54.888	29.85	17.776	65.71
26.5	9.882	44.11	30.779	48.30	55.007	32.00	17.909	66.13
Nov. 5.5	10.033	46.68	30.888	49.31	55.087	34.35	18.011	66.39
15.5	10.126	49.17	30.964	50.20	55.127	36.80	18.082	66.52
25.4	10.163	51.53	31.006	50.94	55.129	39.26	18.124	66.52
Dec. 5.4	10.141	53.69	31.014	51.53	55.092	41.62	18.133	66.41
15.4	10.059	55.60	30.987	51.97	55.021	43.81	18.111	66.20
25.4	9.919	57.18	30.925	52.24	54.916	45.72	18.058	65.92
35.3	9.725	58.40	30.831	52.34	54.779	47.32	17.975	65.57
Mean Place	4.111	37.51	26.788	38.82	52.089	43.46	14.280	55.80
Sec δ , Tan δ	1.769	+1.459	1.122	+0.508	1.189	-0.643	1.034	+0.264
$D\alpha$, $D\omega$	+0.087	-0.073	+0.070	-0.025	+0.050	+0.032	+0.066	-0.013
$D\delta$, $D\omega\delta$	+0.30	+0.66	+0.30	+0.66	+0.30	+0.66	+0.30	+0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ^2 Eridani. Mag. 4.8		τ Persei. Mag. 4.1		η Eridani. Mag. 4.0		ϵ Arietis (mean). Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 47	° ' -21 18	h m 2 48	° ' +52 26	h m 2 52	° ' - 9 12	h m 2 54	° ' +21 1
	s	"	s	"	s	"	s	"
Jan. 0.3	33.187	88.56	48.989	60.29	40.533	24.73	49.215	57.21
10.3	33.061	89.83	48.791	61.18	40.428	25.82	49.114	57.00
20.3	32.914	90.81	48.553	61.65	40.298	26.72	48.984	56.69
30.3	32.748	91.44	48.285	61.71	40.151	27.39	48.832	56.26
Feb. 9.2	32.573	91.77	47.997	61.35	39.993	27.85	48.665	55.74
19.2	32.393	91.73	47.707	60.57	39.827	28.09	48.492	55.12
Mar. 1.2	32.219	91.36	47.424	59.40	39.665	28.07	48.320	54.44
11.2	32.056	90.65	47.168	57.92	39.514	27.81	48.163	53.74
21.1	31.917	89.59	46.949	56.18	39.385	27.28	48.027	53.04
31.1	31.805	88.25	46.783	54.26	39.280	26.51	47.923	52.38
Apr. 10.1	31.732	86.60	46.677	52.24	39.214	25.48	47.857	51.82
20.0	31.701	84.69	46.639	50.22	39.187	24.20	47.836	51.39
30.0	31.714	82.54	46.674	48.27	39.204	22.72	47.862	51.13
May 10.0	31.775	80.19	46.782	46.47	39.267	21.02	47.938	51.06
20.0	31.883	77.71	46.960	44.89	39.375	19.13	48.063	51.21
29.9	32.035	75.13	47.206	43.59	39.527	17.13	48.234	51.58
June 8.9	32.229	72.53	47.510	42.60	39.717	15.02	48.446	52.17
18.9	32.459	69.95	47.864	41.97	39.942	12.86	48.693	52.99
28.9	32.717	67.47	48.259	41.70	40.193	10.72	48.968	54.00
July 8.8	32.999	65.17	48.683	41.80	40.468	8.64	49.264	55.18
18.8	33.297	63.07	49.126	42.28	40.756	6.68	49.575	56.48
28.8	33.602	61.27	49.576	43.11	41.051	4.92	49.890	57.88
Aug. 7.7	33.906	59.79	50.026	44.28	41.347	3.38	50.204	59.33
17.7	34.205	58.72	50.463	45.74	41.634	2.13	50.510	60.79
27.7	34.489	58.06	50.884	47.45	41.909	1.19	50.804	62.23
Sept. 6.7	34.755	57.82	51.278	49.40	42.169	0.60	51.080	63.61
16.6	34.996	58.02	51.641	51.53	42.404	0.35	51.336	64.89
26.6	35.210	58.65	51.969	53.81	42.616	0.47	51.562	66.05
Oct. 6.6	35.397	59.65	52.255	56.19	42.801	0.89	51.765	67.10
16.6	35.549	60.99	52.501	58.63	42.957	1.64	51.939	68.01
26.5	35.667	62.62	52.698	61.08	43.083	2.62	52.085	68.77
Nov. 5.5	35.753	64.45	52.847	63.50	43.179	3.80	52.200	69.40
15.5	35.804	66.40	52.947	65.83	43.243	5.14	52.283	69.91
25.4	35.822	68.39	52.990	68.03	43.277	6.55	52.335	70.29
Dec. 5.4	35.806	70.34	52.980	70.05	43.279	7.97	52.352	70.53
15.4	35.758	72.18	52.916	71.82	43.250	9.36	52.334	70.67
25.4	35.679	73.84	52.797	73.30	43.191	10.65	52.285	70.69
35.3	35.572	75.27	52.627	74.43	43.104	11.82	52.204	70.59
Mean Place	32.654	74.12	47.247	54.59	39.912	13.60	48.293	59.62
Sec δ , Tan δ	1.074	-0.390	1.641	+1.301	1.013	-0.162	1.071	+0.385
$D_{\alpha\alpha}$, $D_{\omega\alpha}$	+0.054	+0.019	+0.084	-0.064	+0.058	+0.008	+0.068	-0.019
$D_{\delta\delta}$, $D_{\omega\delta}$	+0.30	+0.67	+0.29	+0.67	+0.29	+0.68	+0.29	+0.69

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Eridani. Mag. 3.4		47 H. Cephei. Mag. 5.7		α Ceti. Mag. 2.8		τ^3 Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 55	° ' -40 36	h m 2 55	° ' +79 6	h m 2 58	° ' + 3 47	h m 2 58	° ' -23 55
	s	"	s	"	s	"	s	"
Jan. 0.3	21.189	64.50 ¹⁵⁴	53.22	68.28 ¹⁸³	15.868	11.05 ⁷⁶	60.409 ¹²⁵	46.77 ¹⁴⁰
10.3	21.007 ¹⁸²	66.04 ¹⁰⁸	52.40 ⁸²	70.11 ¹²⁸	15.772 ⁹⁶	10.29 ⁶⁹	60.284 ¹⁵⁰	48.17 ¹⁰⁷
20.3	20.799 ²⁰⁸	67.12 ⁶¹	51.46 ⁹⁴	71.39 ⁷¹	15.650 ¹²²	9.60 ⁶¹	60.134 ¹⁷¹	49.24 ⁷²
30.3	20.571 ²²⁸	67.73 ¹²	50.43 ¹⁰³	72.10 ⁸	15.508 ¹⁴²	8.99 ⁵⁴	59.963 ¹⁸²	49.96 ³⁶
Feb. 9.2	20.331 ²⁴⁰	67.85 ³⁶	49.35 ¹⁰⁸	72.18 ⁵³	15.353 ¹⁵⁵	8.45 ⁴²	59.781 ¹⁸⁹	50.32 ⁰
19.2	20.089 ²⁴²	67.49 ⁸³	48.27 ¹⁰⁸	71.65 ¹⁰⁹	15.192 ¹⁶⁰	8.03 ³¹	59.592 ¹⁸⁶	50.32 ³⁸
Mar. 1.2	19.853 ²³⁶	66.66 ¹³⁰	47.23 ¹⁰⁴	70.56 ¹⁶¹	15.032 ¹⁴⁸	7.72 ¹⁷	59.406 ¹⁷³	49.94 ⁷⁴
11.2	19.633 ²²⁰	65.36 ¹⁷⁰	46.28 ⁹⁵	68.95 ²⁰⁸	14.884 ¹³⁰	7.55 ¹	59.233 ¹⁵³	49.20 ¹⁰⁹
21.1	19.439 ¹⁹⁴	63.66 ²⁰⁹	45.45 ⁸³	66.87 ²⁴⁵	14.754 ¹⁰¹	7.54 ¹⁴	59.080 ¹²⁵	48.11 ¹⁴⁰
31.1	19.279 ¹⁶⁰	61.57 ²⁴²	44.79 ⁴⁶	64.42 ²⁶⁸	14.653 ⁶⁷	7.68 ³⁵	58.955 ⁸⁸	46.71 ¹⁷³
Apr. 10.1	19.159 ⁷¹	59.15 ²⁷¹	44.33 ²⁶	61.74 ²⁸⁶	14.586 ²⁵	8.03 ⁵⁶	58.867 ⁴⁷	44.98 ²⁰⁰
20.0	19.088 ¹⁸	56.44 ²⁹⁴	44.07 ⁴	58.88 ²⁹⁰	14.561 ¹⁶	8.59 ⁷⁴	58.820 ²	42.98 ²²³
30.0	19.070 [—]	53.50 ³¹¹	44.03 [—]	55.98 ²⁸²	14.577 ⁶⁵	9.33 ⁹⁵	58.818 ⁴⁶	40.75 ²⁴³
May 10.0	19.106 ³⁶	50.39 ³²⁰	44.22 ³⁹	53.16 ²⁷⁰	14.642 ¹⁰⁹	10.28 ¹¹⁷	58.864 ⁹⁴	38.32 ²⁵⁹
20.0	19.198 ¹⁴⁴	47.19 ³²⁴	44.61 ⁶⁰	50.46 ²⁴³	14.751 ¹⁵³	11.45 ¹³²	58.958 ¹⁴¹	35.73 ²⁶⁷
29.9	19.342 ¹⁹⁶	43.95 ³¹⁹	45.21 ⁷⁸	48.03 ²¹¹	14.904 ¹⁹²	12.77 ¹⁴⁸	59.099 ¹⁸³	33.06 ²⁷⁰
June 8.9	19.538 ²⁴⁰	40.76 ³⁰⁷	45.99 ⁹³	45.92 ¹⁷³	15.096 ²⁵⁴	14.25 ¹⁶²	59.282 ²²¹	30.36 ²⁶⁷
18.9	19.778 ²⁷⁹	37.69 ²⁸⁵	46.92 ¹⁰⁶	44.19 ¹³⁰	15.319 ²²³	15.87 ¹⁶⁷	59.503 ²⁵⁴	27.69 ²⁵⁶
28.9	20.057 ³⁰⁹	34.84 ²⁵⁸	47.98 ¹¹⁷	42.89 ⁸³	15.573 ²⁷⁴	17.54 ¹⁷³	59.757 ²⁷⁷	25.13 ²⁴⁰
July 8.8	20.366 ³³²	32.26 ²²³	49.15 ¹²³	42.06 ³⁶	15.847 ²⁹¹	19.27 ¹⁷¹	60.034 ²⁹⁵	22.73 ²¹⁵
18.8	20.698 ³⁴⁶	30.03 ¹⁸⁰	50.38 ¹²⁸	41.70 ¹⁴	16.138 ²⁹⁵	20.98 ¹⁶⁴	60.329 ³⁰⁵	20.58 ¹⁸⁷
28.8	21.044 ³⁵²	28.23 ¹³⁵	51.66 ¹³⁰	41.84 ⁶²	16.433 ²⁹⁵	22.62 ¹⁵⁴	60.634 ³⁰⁸	18.71 ¹⁵⁰
Aug. 7.7	21.396 ³⁴⁷	26.88 ⁸²	52.96 ¹²⁸	42.46 ¹¹¹	16.728 ²⁸⁸	24.16 ¹³⁶	60.942 ³⁰²	17.21 ¹⁰⁹
17.7	21.743 ³³⁵	26.06 ³⁰	54.24 ¹²⁴	43.57 ¹⁵⁴	17.016 ²⁷⁷	25.52 ¹¹⁷	61.244 ²⁹¹	16.12 ⁶⁶
27.7	22.078 ³¹⁵	25.76 ²⁵	55.48 ¹¹⁸	45.11 ¹⁹⁴	17.293 ²⁶⁰	26.69 ⁹⁵	61.535 ²⁷⁴	15.46 ²¹
Sept. 6.7	22.393 ²⁸⁷	26.01 ⁸⁰	56.66 ¹¹⁰	47.05 ²³¹	17.553 ²⁴²	27.64 ⁷⁰	61.809 ²⁵²	15.25 ²⁴
16.6	22.680 ²⁵⁵	26.81 ¹³¹	57.76 ⁹⁹	49.36 ²⁶⁸	17.795 ²¹⁶	28.34 ⁴⁵	62.061 ²²⁶	15.49 ⁶⁹
26.6	22.935 ²¹⁹	28.12 ¹⁷⁷	58.75 ⁸⁶	52.04 ²⁹¹	18.011 ¹⁹¹	28.79 ²¹	62.287 ¹⁹⁵	16.18 ¹¹⁰
Oct. 6.6	23.154 ¹⁷⁸	29.89 ²¹⁶	59.61 ⁷³	54.95 ³¹⁶	18.202 ¹⁶⁵	29.00 ⁴	62.482 ¹⁶⁴	17.28 ¹⁴⁵
16.6	23.330 ¹³⁴	32.05 ²⁴⁶	60.34 ⁵⁷	58.11 ³³⁴	18.367 ¹³⁶	28.96 ²⁴	62.646 ¹³⁰	18.73 ¹⁷⁶
26.5	23.464 ⁹⁰	34.51 ²⁶⁶	60.91 ³⁹	61.45 ³⁴⁰	18.503 ¹⁰⁷	28.72 ⁴⁴	62.776 ⁹⁸	20.49 ¹⁹⁶
Nov. 5.5	23.554 ⁴⁴	37.17 ²⁷⁷	61.30 ²²	64.85 ³⁴²	18.610 ⁷⁷	28.28 ⁵⁹	62.874 ⁶²	22.45 ²¹¹
15.5	23.598 ³	39.94 ²⁷⁶	61.52 ²	68.27 ³³⁴	18.687 ⁴⁸	27.69 ⁶⁷	62.936 ²⁶	24.56 ²¹⁵
25.4	23.595 ⁴⁵	42.70 ²⁶⁵	61.54 ¹⁸	71.61 ³²⁰	18.735 ¹¹	27.02 ⁷⁵	62.962 ⁹	26.71 ²¹⁰
Dec. 5.4	23.550 ⁸⁶	45.35 ²⁴⁴	61.36 ³⁷	74.81 ²⁹¹	18.749 ¹⁶	26.27 ⁷⁹	62.953 ⁴³	28.81 ¹⁹⁹
15.4	23.464 ¹²⁵	47.79 ²¹³	60.99 ⁵⁵	77.72 ²⁵⁸	18.733 ⁴⁷	25.48 ⁷⁸	62.910 ⁷⁶	30.80 ¹⁸⁰
25.4	23.339 ¹⁶¹	49.92 ¹⁷⁷	60.44 ⁷³	80.30 ²¹⁵	18.686 ⁷⁷	24.70 ⁷⁴	62.834 ¹⁰⁶	32.60 ¹⁵³
35.3	23.178	51.69	59.71	82.45	18.609	23.96	62.728	34.13
Mean Place	20.624	45.40	46.841	59.32	15.125	18.58	59.814	31.55
Sec δ , Tan δ	1.317	-0.858	5.297	+5.201	1.002	+0.066	1.094	-0.444
$D\psi\alpha$, $D\omega\alpha$	+0.045	+0.041	+0.157	-0.250	+0.062	-0.003	+0.053	+0.021
$D\psi\delta$, $D\omega\delta$	+0.29	+0.69	+0.29	+0.69	+0.28	+0.70	+0.28	+0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Persei. Mag. 3.1		ρ Persei. Var. 3.4-4.2		μ Horologii. Mag. 5.2		θ Hydri. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 2 59 s	° ' +53 12 "	h m 3 0 s	° ' +38 32 "	h m 3 1 s	° ' -60 1 "	h m 3 1 s	° ' -72 11 "
Jan. 0.3	14.359	27.25	15.431	36.17	48.42	91.04	66.18	94.70
10.3	14.166 ¹⁹³	28.26 ⁶⁰	15.301 ¹³⁰	36.61 ⁴⁴	48.08 ³⁴	92.65 ¹⁶¹	65.56 ⁶²	96.17 ¹⁴⁷
20.3	13.929 ²³⁷	28.86 ¹⁷	15.139 ¹⁶²	36.80 ¹⁹	47.72 ³⁶	93.69 ¹⁰⁴	64.89 ⁶⁷	97.05 ⁸⁸
30.3	13.659 ²⁷⁰	29.03 ¹⁷	14.947 ¹⁹²	36.68 ¹²	47.32 ⁴⁰	94.17 ⁴⁸	64.19 ⁷⁰	97.36 ³¹
Feb. 9.2	13.366 ²⁹³	28.79 ²⁴	14.738 ²⁰⁹	36.30 ³⁸	46.91 ¹¹	94.06 ¹¹	63.47 ⁷²	97.05 ³¹
	300	66	216	68	41	66	72	87
19.2	13.066	28.13	14.522	35.62	46.50	93.40	62.75	96.18
Mar. 1.2	12.773 ²⁹³	27.08 ¹⁰⁵	14.309 ²¹³	34.72 ⁹⁰	46.10 ⁴⁰	92.19 ¹²¹	62.06 ⁶⁹	94.73 ¹⁴⁵
11.2	12.502 ²⁷¹	25.69 ¹³⁹	14.111 ¹⁹⁸	33.59 ¹¹³	45.72 ³⁸	90.48 ¹⁷¹	61.42 ⁶⁴	92.79 ¹⁹⁴
21.1	12.269 ²³³	24.02 ¹⁶⁷	13.939 ¹⁷²	32.31 ¹²⁸	45.39 ³³	88.30 ²¹⁸	60.83 ⁵⁹	90.41 ²³⁸
31.1	12.085 ¹⁸¹	22.14 ¹⁸⁸	13.808 ¹³¹	30.94 ¹³⁷	45.10 ²⁹	85.74 ²⁵⁶	60.33 ⁵⁰	87.63 ²⁷⁸
	123	199	88	139	23	293	41	311
Apr. 10.1	11.962	20.15	13.720	29.55	44.87	82.81	59.92	84.52
20.0	11.908 ⁵⁴	18.12 ²⁰³	13.685 ³⁵	28.19 ¹³⁶	44.72 ¹⁵	79.60 ³²¹	59.62 ³⁰	81.16 ³³⁶
30.0	11.926 ¹⁸	16.14 ¹⁹⁸	13.707 ²²	26.94 ¹²⁵	44.63 ¹	76.18 ³⁴²	59.43 ¹⁹	77.61 ³⁵⁵
May 10.0	12.021 ⁹⁵	14.29 ¹⁸⁵	13.788 ⁸¹	25.85 ¹⁰⁹	44.62 ¹	72.63 ³⁵⁵	59.36 ⁷	73.96 ³⁶⁵
20.0	12.186 ¹⁶⁵	12.64 ¹⁶⁵	13.926 ¹³⁸	24.96 ⁸⁹	44.69 ⁷	69.02 ³⁶¹	59.41 ⁵	70.28 ³⁶⁸
	234	111	192	65	15	358	18	361
29.9	12.420	11.23	14.118	24.31	44.84	65.44	59.59	66.67
June 8.9	12.715 ²⁹⁵	10.15 ¹⁰⁸	14.357 ²³⁹	23.94 ³⁷	45.06 ²²	61.98 ³⁴⁶	59.88 ²⁹	63.21 ³⁴⁶
18.9	13.064 ³⁴⁹	9.37 ⁷⁸	14.640 ²⁸³	23.86 ⁸	45.35 ²⁹	58.70 ³²⁸	60.28 ⁴⁰	59.96 ³²⁵
28.9	13.457 ³⁹³	8.98 ³⁹	14.955 ³¹⁵	24.07 ²¹	45.70 ³⁵	55.70 ³⁰⁰	60.78 ⁵⁰	57.05 ²⁹¹
July 8.8	13.880 ⁴²³	8.96 ²	15.297 ³⁴²	24.57 ⁵⁰	46.10 ⁴⁰	53.06 ²⁶⁴	61.37 ⁵⁹	54.52 ²⁵³
	416	32	358	71	44	220	67	208
18.8	14.326	9.28	15.655	25.31	46.54	50.86	62.04	52.44
28.8	14.782 ⁴⁵⁶	9.96 ⁶⁸	16.020 ³⁶⁵	26.33 ¹⁰²	47.02 ⁴⁸	49.14 ¹⁷²	62.74 ⁷⁰	50.89 ¹⁵⁵
Aug. 7.7	15.240 ⁴⁵⁸	11.00 ¹⁰⁴	16.386 ³⁶⁶	27.55 ¹²²	47.50 ⁴⁸	47.98 ¹¹⁶	63.48 ⁷⁴	49.92 ⁹⁷
17.7	15.689 ⁴⁴⁹	12.31 ¹³¹	16.744 ³⁵⁸	28.95 ¹⁴⁰	47.98 ⁴⁸	47.41 ⁵⁷	64.23 ⁷⁵	49.54 ³⁸
27.7	16.123 ⁴³⁴	13.92 ¹⁶¹	17.088 ³¹⁴	30.51 ¹⁵⁶	48.46 ⁴⁸	47.45 ⁴	64.97 ⁷⁴	49.79 ²⁵
	409	184	326	164	45	65	69	86
Sept. 6.7	16.532	15.76	17.414	32.15	48.91	48.10	65.66	50.65
16.6	16.912 ³⁸⁰	17.80 ²⁰⁴	17.716 ³⁰²	33.88 ¹⁷³	49.32 ⁴¹	49.33 ¹²³	66.30 ⁶⁴	52.11 ¹⁴⁶
26.6	17.258 ³¹⁶	20.00 ²²⁰	17.990 ²⁷⁴	35.66 ¹⁷⁸	49.69 ³⁷	51.13 ¹⁸⁰	66.86 ⁵⁶	54.10 ¹⁹⁹
Oct. 6.6	17.565 ³⁰⁷	22.31 ²³¹	18.234 ²⁴⁴	37.44 ¹⁷⁸	49.99 ³⁰	53.42 ²²⁹	67.33 ⁴⁷	56.58 ²⁴⁸
16.6	17.829 ²⁶⁴	24.70 ²³⁹	18.446 ²¹²	39.19 ¹⁷⁵	50.24 ²⁵	56.10 ²⁶⁸	67.69 ³⁶	59.44 ²⁸⁶
	218	213	177	171	17	299	25	313
26.5	18.047 ¹⁶⁹	27.13 ²⁴²	18.623 ¹⁴¹	40.90 ¹⁶⁵	50.41 ¹⁰	59.09 ³¹⁸	67.94 ¹⁰	62.57 ³²⁹
Nov. 5.5	18.216 ¹¹⁸	29.55 ²³⁵	18.764 ¹⁰³	42.55 ¹⁵⁵	50.51 ²	62.27 ³²⁵	68.04 ²	65.86 ³³⁴
15.5	18.334 ⁶²	31.90 ²²⁶	18.867 ⁶²	44.10 ¹⁴³	50.53 ⁵	65.52 ³¹⁸	68.02 ¹⁴	69.20 ³²⁴
25.4	18.396 ⁶	34.16 ²⁰⁸	18.929 ²¹	45.53 ¹²⁸	50.48 ¹²	68.70 ³⁰²	67.88 ²⁸	72.44 ³⁰²
Dec. 5.4	18.402 ⁵¹	36.24 ¹⁸⁴	18.950 ²²	46.81 ¹⁰⁹	50.36 ¹⁹	71.72 ²⁷³	67.60 ³⁸	75.46 ²⁶⁹
15.4	18.351	38.08	18.928	47.90	50.17	74.45	67.22	78.15
25.4	18.242 ¹⁰⁹	39.67 ¹⁵⁹	18.864 ⁶⁴	48.78 ⁸⁸	49.92 ²⁵	76.79 ²³⁴	66.74 ⁴⁸	80.43 ²²⁸
35.3	18.080 ¹⁶²	40.90 ¹²³	18.758 ¹⁰⁶	49.42 ⁶⁴	49.62 ³⁰	78.69 ¹⁹⁰	66.18 ⁵⁶	82.21 ¹⁷⁸
Mean Place	12.522	22.13	14.139	34.28	47.627	68.80	64.947	71.33
Sec δ , Tan δ	1.670	+1.337	1.279	+0.797	2.002	-1.734	3.273	-3.115
$D\psi\alpha$, $D\omega\alpha$	+0.086	-0.063	+0.076	-0.038	+0.028	+0.081	+0.002	+0.146
$D\psi\delta$, $D\omega\delta$	+0.28	+0.70	+0.28	+0.71	+0.28	+0.71	+0.28	+0.71

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Persei. (Algol.) Var. 2.1-3.2		δ Arietis. Mag. 4.5		12 Eridani. Mag. 4.0		ζ Arietis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 3	° ' +40 39	h m 3 7	° ' +19 26	h m 3 8	° ' -29 17	h m 3 10	° ' +20 45
	s	"	s	"	s	"	s	"
Jan. 0.4	10.460	38.58	14.304	8.16	48.588	40.44	29.282	32.69
10.3	10.324 ¹³⁶	39.11 ⁵³	14.210 ⁹⁴	7.93 ²³	48.453 ¹³⁵	41.98 ¹⁵⁴	29.190 ⁹²	32.52 ¹⁷
20.3	10.155 ¹⁶⁹	39.38 ²⁷	14.087 ¹²³	7.62 ³¹	48.293 ¹⁶⁰	43.13 ¹¹⁵	29.066 ¹²¹	32.24 ²⁸
30.3	9.956 ¹⁹⁹	39.33 ⁵	13.938 ¹⁴⁹	7.22 ⁴⁰	48.110 ¹⁸³	43.91 ⁷⁸	28.918 ¹⁴⁸	31.88 ³⁶
Feb. 9.2	9.740 ²¹⁶	39.00 ³³	13.775 ¹⁶³	6.73 ⁴⁹	47.913 ¹⁹⁷	44.28 ³⁷	28.751 ¹⁶⁷	31.42 ⁴⁶
	226	64	173	56	203	4	175	55
19.2	9.514	38.36	13.602	6.17	47.710	44.24	28.576	30.87
Mar. 1.2	9.289 ²²⁵	37.44 ⁹²	13.429 ¹⁷³	5.58 ⁵⁹	47.507 ²⁰³	43.77 ⁴⁷	28.400 ¹⁷⁶	30.27 ⁶⁰
11.2	9.082 ²⁰⁷	36.31 ¹¹³	13.267 ¹⁶²	4.95 ⁶³	47.316 ¹⁹¹	42.92 ⁸⁵	28.234 ¹⁶⁶	29.63 ⁶⁴
21.1	8.903 ¹⁷⁹	34.99 ¹³²	13.124 ¹⁴³	4.36 ⁵⁹	47.146 ¹⁷⁰	41.67 ¹²⁵	28.088 ¹⁴⁶	28.99 ⁶⁴
31.1	8.762 ¹⁴¹	33.55 ¹⁴⁴	13.011 ¹¹³	3.80 ⁵⁶	47.003 ¹⁴³	40.09 ¹⁵⁸	27.971 ¹¹⁷	28.39 ⁶⁰
	94	147	75	45	107	191	79	53
Apr. 10.1	8.668	32.08	12.936	3.35	46.896	38.18	27.892	27.86
20.1	8.627 ⁴¹	30.64 ¹⁴⁴	12.903 ³³	3.00 ³⁵	46.833 ⁶³	35.96 ²²²	27.856 ³⁶	27.45 ⁴¹
30.0	8.646 ¹⁹	29.29 ¹³⁵	12.917 ¹⁴	2.83 ¹⁷	46.816 ¹⁷	33.48 ²¹⁸	27.867 ¹¹	27.20 ²⁵
May 10.0	8.726 ⁸⁰	28.07 ¹²²	12.980 ⁶³	2.85 ²	46.848 ³²	30.82 ²⁶⁶	27.927 ⁶⁰	27.12 ⁸
20.0	8.864 ¹³⁸	27.06 ¹⁰¹	13.093 ¹¹³	3.06 ²¹	46.930 ⁸²	28.01 ²⁸¹	28.036 ¹⁰⁹	27.23 ¹¹
	191	78	157	43	130	289	156	34
29.9	9.055	26.28	13.250	3.49	47.060	25.12	28.192	27.57
June 8.9	9.297 ²⁴²	25.79 ⁴⁹	13.449 ¹⁹⁹	4.12 ⁶³	47.236 ¹⁷⁶	22.21 ²⁹¹	28.390 ¹⁹⁸	28.11 ⁵⁴
18.9	9.584 ²⁸⁷	25.58 ²¹	13.686 ²³⁷	4.94 ⁸²	47.452 ²¹⁶	19.35 ²⁸⁶	28.625 ²³⁵	28.87 ⁷⁶
28.9	9.905 ³²¹	25.69 ¹¹	13.951 ²⁶⁵	5.96 ¹⁰²	47.702 ²⁵⁰	16.63 ²⁷²	28.891 ²⁶⁶	29.80 ⁹³
July 8.8	10.253 ³¹⁸	26.09 ⁴⁰	14.239 ²⁸⁸	7.12 ¹¹⁶	47.980 ²⁷⁸	14.08 ²⁵⁵	29.179 ²⁸⁸	30.89 ¹⁰⁹
	366	66	304	128	300	226	305	122
18.8	10.619	26.75	14.543	8.40	48.280	11.82	29.484	32.11
28.8	10.993 ³⁷⁴	27.67 ⁹²	14.854 ³¹¹	9.76 ¹³⁶	48.592 ³¹²	9.88 ¹⁹⁴	29.796 ³¹²	33.42 ¹³¹
Aug. 7.8	11.368 ³⁷⁵	28.83 ¹¹⁶	15.167 ³¹³	11.16 ¹⁴⁰	48.908 ³¹⁶	8.33 ¹⁵⁵	30.110 ³¹¹	34.78 ¹³⁶
17.7	11.737 ³⁶⁹	30.21 ¹³⁸	15.473 ³⁰⁶	12.54 ¹³⁸	49.223 ³¹⁵	7.22 ¹¹¹	30.418 ³⁰⁸	36.15 ¹³⁷
27.7	12.091 ³⁵⁴	31.73 ¹⁵²	15.768 ²⁹⁵	13.90 ¹³⁶	49.528 ³⁰⁵	6.59 ⁶³	30.716 ²⁹⁸	37.49 ¹³⁴
	336	167	280	126	288	15	282	128
Sept. 6.7	12.427	33.40	16.048	15.16	49.816	6.44	30.998	38.77
16.6	12.740 ³¹³	35.16 ¹⁷⁶	16.308 ²⁶⁰	16.34 ¹¹⁸	50.084 ²⁶⁸	6.78 ³⁴	31.261 ²⁶³	39.96 ¹¹⁹
26.6	13.024 ²⁸¹	36.99 ¹⁸³	16.545 ²³⁷	17.39 ¹⁰⁵	50.326 ²¹²	7.61 ⁸³	31.502 ²¹¹	41.03 ¹⁰⁷
Oct. 6.6	13.278 ²⁵¹	38.82 ¹⁸³	16.757 ²¹²	18.31 ⁹²	50.537 ²¹¹	8.89 ¹²⁸	31.718 ²¹⁶	41.99 ⁹⁶
16.6	13.498 ²²⁰	40.67 ¹⁸⁵	16.942 ¹⁸⁵	19.09 ⁷⁸	50.715 ¹⁷⁸	10.54 ¹⁶⁵	31.908 ¹⁹⁰	42.82 ⁸³
	185	181	156	63	143	197	160	69
26.5	13.683 ¹⁴⁸	42.48 ¹⁷⁶	17.098 ¹²⁸	19.72 ⁴⁹	50.858 ¹⁰⁷	12.51 ²²⁰	32.068 ¹³³	43.51 ⁵⁷
Nov. 5.5	13.831 ¹⁰⁸	44.24 ¹⁶⁷	17.226 ⁹⁶	20.21 ³⁸	50.965 ⁶⁹	14.71 ²³⁵	32.201 ¹⁰¹	44.08 ⁴⁵
15.5	13.939 ⁶⁷	45.91 ¹⁵⁵	17.322 ⁶⁴	20.59 ²⁸	51.034 ³²	17.06 ²³⁹	32.302 ⁶⁷	44.53 ³⁴
25.5	14.006 ²²	47.46 ¹²⁹	17.386 ³¹	20.87 ¹⁵	51.066 ⁶	19.45 ²³⁵	32.369 ³³	44.87 ²²
Dec. 5.4	14.028 ²¹	48.85 ¹³²	17.417 ⁶	21.02 ⁴	51.060 ⁴³	21.80 ²²⁰	32.402 ¹	45.09 ¹³
15.4	14.007 ⁶⁶	50.07 ¹⁰¹	17.411 ³⁹	21.06 ⁴	51.017 ⁷⁹	24.00 ²⁰⁰	32.401 ³⁷	45.22 ⁴
25.4	13.941 ¹⁰⁸	51.08 ⁷⁵	17.372 ⁷³	21.02 ¹⁴	50.938 ¹¹⁵	26.00 ¹⁷¹	32.364 ⁷²	45.26 ⁹
35.3	13.833	51.83	17.299	20.88	50.823	27.71	32.292	45.17
Mean Place	9.095	36.35	13.351	11.58	47.936	23.87	28.297	35.91
Sec δ , Tan δ	1.318	+0.859	1.060	+0.353	1.147	-0.561	1.070	+0.379
$D\psi\alpha$, $D\omega\alpha$	+0.077	-0.040	+0.068	-0.016	+0.050	+0.025	+0.069	-0.017
$D\psi\delta$, $D\omega\delta$	+0.28	+0.72	+0.27	+0.73	+0.27	+0.73	+0.27	+0.74

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	48 H. Cephei. Mag. 5.5		38 G. Horologii. Mag. 5.7		ζ Eridani. Mag. 4.9		τ Arietis. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 10	° ' +77 26	h m 3 10	° ' -57 36	h m 3 12	° ' - 9 6	h m 3 16	° ' +20 52
	s	"	s	"	s	"	s	"
Jan. 0.4	35.17	81.94 ¹⁹⁶	36.742	56.35 ¹⁷¹	6.227	28.80 ¹¹³	47.704 ⁹⁰	9.97 ¹⁵
10.3	34.52	83.90 ¹⁴⁰	36.446 ²⁹⁷	58.06 ¹¹⁹	6.131 ⁹⁶	29.93 ¹²¹	47.614 ¹²¹	9.82 ²⁶
20.3	33.74	85.30 ⁸⁴	36.110 ³³⁵	59.25 ⁶³	6.007 ¹²⁴	30.91 ⁹⁸	47.493 ¹⁴⁷	9.56 ³³
30.3	32.88	86.14 ²⁸	35.747 ³⁷⁹	59.88 ⁶	5.861 ¹⁶⁰	31.65 ⁵²	47.346 ¹⁶⁵	9.23 ⁴³
Feb. 9.2	31.96	86.42 ³³	35.368 ³⁸²	59.94 ⁵¹	5.701 ¹⁷⁰	32.17 ²⁸	47.181 ¹⁷⁷	8.80 ⁵¹
19.2	31.02	86.09 ⁹³	34.986 ³⁷⁵	59.43 ¹⁰⁴	5.531 ¹⁷⁰	32.45 ³	47.004 ¹⁷⁸	8.29 ⁵⁸
Mar. 1.2	30.11	85.16 ¹⁴³	34.611 ³⁵⁴	58.39 ¹⁵⁵	5.361 ¹⁶¹	32.48 ²⁰	46.826 ¹⁶⁹	7.71 ⁶¹
11.2	29.26	83.73 ¹⁹⁰	34.257 ³²⁰	56.84 ²⁰²	5.200 ¹⁴³	32.28 ⁴⁸	46.657 ¹⁵⁰	7.10 ⁶²
21.1	28.51	81.83 ²³¹	33.937 ²⁷⁶	54.82 ²⁴⁴	5.057 ¹¹⁹	31.80 ⁷¹	46.507 ¹²¹	6.48 ⁵⁹
31.1	27.90	79.52 ²⁵⁷	33.661 ²²²	52.38 ²⁸⁰	4.938 ⁸⁵	31.09 ⁹⁹	46.386 ⁸⁵	5.89 ⁵²
Apr. 10.1	27.44	76.95 ²⁷⁷	33.439 ¹⁶¹	49.58 ³¹¹	4.853 ⁴⁵	30.10 ¹²³	46.301 ⁴³	5.37 ⁴¹
20.1	27.16	74.18 ²⁸³	33.278 ⁹⁰	46.47 ³³²	4.808 ²	28.87 ¹⁴⁵	46.258 ⁵	4.96 ²⁶
30.0	27.08	71.35 ²⁸⁰	33.188 ²⁰	43.15 ³⁴⁹	4.806 ⁴⁴	27.42 ¹⁶⁶	46.263 ⁵⁴	4.70 ¹⁰
May 10.0	27.19	68.55 ²⁶⁸	33.168 ⁵⁷	39.66 ³⁵⁷	4.850 ⁸⁹	25.76 ¹⁸⁵	46.317 ¹⁰⁴	4.60 ¹⁰
20.0	27.49	65.87 ²⁴⁷	33.225 ¹²⁹	36.09 ³⁵⁸	4.939 ¹³⁴	23.91 ¹⁹⁷	46.421 ¹⁴⁹	4.70 ³¹
29.9	27.96	63.40 ²¹⁷	33.354 ²⁰⁰	32.51 ³⁴⁷	5.073 ¹⁷⁴	21.94 ²⁰⁹	46.570 ¹⁹⁴	5.01 ⁵¹
June 8.9	28.60	61.23 ¹⁸³	33.554 ²⁶⁵	29.04 ³³¹	5.247 ²⁰⁸	19.85 ²¹⁵	46.764 ²³⁰	5.52 ⁷²
18.9	29.38	59.40 ¹⁴³	33.819 ³²³	25.73 ³⁰⁷	5.455 ²¹¹	17.70 ²¹⁴	46.994 ²⁶²	6.24 ⁸⁹
28.9	30.29	57.97 ⁹⁷	34.142 ³⁷²	22.66 ²⁷⁰	5.696 ²⁶³	15.56 ²⁰⁹	47.256 ²⁸⁵	7.13 ¹⁰⁵
July 8.8	31.29	57.00 ⁵¹	34.514 ⁴¹²	19.96 ²³¹	5.959 ²⁸⁰	13.47 ¹⁹⁷	47.541 ³⁰³	8.18 ¹¹⁹
18.8	32.36	56.49 ³	34.926 ⁴⁴⁰	17.65 ¹⁸²	6.239 ²⁹¹	11.50 ¹⁷⁹	47.844 ³¹¹	9.37 ¹²⁷
28.8	33.48	56.46 ⁴³	35.366 ⁴⁵⁵	15.83 ¹³⁰	6.530 ²⁹⁵	9.71 ¹⁵⁷	48.155 ³¹⁴	10.64 ¹³²
Aug. 7.8	34.62	56.89 ⁸⁹	35.821 ⁴⁵⁸	14.53 ⁷¹	6.825 ²⁸⁸	8.14 ¹²⁹	48.469 ³¹⁰	11.96 ¹³³
17.7	35.76	57.78 ¹³⁴	36.279 ⁴⁴⁹	13.82 ¹¹	7.113 ²⁷⁹	6.85 ⁹⁸	48.779 ²⁹⁹	13.29 ¹³¹
27.7	36.88	59.12 ¹⁷⁵	36.728 ⁴²⁹	13.71 ⁵¹	7.392 ²⁶⁶	5.87 ⁶⁴	49.078 ²⁸⁶	14.60 ¹²⁵
Sept. 6.7	37.94	60.87 ²¹³	37.157 ³⁹⁶	14.22 ¹⁰⁹	7.658 ²⁴⁸	5.23 ²⁸	49.364 ²⁶⁶	15.85 ¹¹⁵
16.6	38.94	63.00 ²⁴⁶	37.553 ³⁵⁴	15.31 ¹⁶⁵	7.906 ²²⁵	4.95 ⁹	49.630 ²⁴⁶	17.00 ¹⁰⁶
26.6	39.86	65.46 ²⁷⁷	37.907 ³⁰³	16.96 ²¹⁶	8.131 ²⁰⁰	5.04 ⁴¹	49.876 ²²¹	18.06 ⁹⁴
Oct. 6.6	40.68	68.23 ³⁰¹	38.210 ²⁴⁵	19.12 ²⁵⁹	8.331 ¹⁷³	5.45 ⁷³	50.097 ¹⁹⁸	19.00 ⁸¹
16.6	41.38	71.24 ³¹⁸	38.455 ¹⁸¹	21.71 ²⁹⁰	8.504 ¹⁴⁴	6.18 ⁹⁹	50.293 ¹⁶⁷	19.81 ⁶⁷
26.5	41.95	74.42 ³³¹	38.636 ¹¹⁴	24.61 ³¹⁴	8.648 ¹¹⁵	7.17 ¹²⁰	50.460 ¹⁴⁰	20.48 ⁵⁶
Nov. 5.5	42.38	77.73 ³³²	38.750 ⁴⁴	27.75 ³²²	8.763 ⁸³	8.37 ¹³⁶	50.600 ¹⁰⁸	21.04 ⁴⁵
15.5	42.65	81.05 ³²⁹	38.794 ²⁴	30.97 ³¹⁹	8.846 ⁵²	9.73 ¹⁴⁵	50.708 ⁷⁴	21.49 ³³
25.5	42.75	84.34 ³¹⁸	38.770 ⁹³	34.16 ³⁰⁵	8.898 ²¹	11.18 ¹⁴⁷	50.782 ⁴⁰	21.82 ²²
Dec. 5.4	42.68	87.52 ²⁹³	38.677 ¹⁵⁶	37.21 ²⁷⁹	8.919 ¹⁴	12.65 ¹⁴⁴	50.822 ⁵	22.04 ¹⁴
15.4	42.43	90.45 ²⁶⁴	38.521 ²¹⁵	40.00 ²⁴³	8.905 ⁴⁵	14.09 ¹³⁵	50.827 ³²	22.18 ⁴
25.4	42.02	93.09 ²²⁴	38.306 ²⁶⁵	42.43 ²⁰⁰	8.860 ⁷⁷	15.44 ¹²²	50.795 ⁶⁷	22.22 ⁵
35.3	41.45	95.33	38.041	44.43	8.783	16.66	50.728	22.17
Mean Place	29.472	74.30	35.884	34.59	5.504	17.31	46.690	13.46
Sec δ, Tan δ	4.604	+4.494	1.867	-1.577	1.013	-0.160	1.070	+0.381
D _α , D _{ωα}	+0.149	-0.202	+0.030	+0.071	+0.058	+0.007	+0.069	-0.017
D _{βδ} , D _{ωδ}	+0.27	+0.74	+0.27	+0.74	+0.27	+0.74	+0.26	+0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Eridani. Mag. 4.3		ι Hydri. Mag. 5.5		α Persei. Mag. 1.9		σ Tauri. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 16 s	° ' -43 21 "	h m 3 17 s	° ' -77 39 "	h m 3 18 s	° ' +49 35 "	h m 3 20 s	° ' + 8 45 "
Jan. 0.4	51.897	67.88	53.02	96.51	50.717	21.20	40.906	25.11
10.3	51.721 ¹⁷⁶	69.63 ¹⁷⁵	52.12 ⁹⁰	98.11 ¹⁶⁰	50.561 ¹⁵⁶	22.22 ¹⁰²	40.822 ⁸⁴	24.52 ⁵⁹
20.3	51.513 ²⁰⁸	70.93 ¹³⁰	51.14 ⁹⁸	99.16 ¹⁰⁵	50.363 ¹⁹⁸	22.90 ⁶⁸	40.711 ¹¹¹	23.94 ⁵⁸
30.3	51.281 ²³²	71.73 ⁸⁰	50.09 ¹⁰⁵	99.59 ⁴³	50.127 ²³⁶	23.17 ²⁷	40.572 ¹³⁹	23.40 ⁵⁴
Feb. 9.3	51.032 ²⁴⁹	72.04 ³¹	49.01 ¹⁰⁸	99.45 ¹⁴	49.865 ²⁶²	23.08 ⁹	40.417 ¹⁵⁵	22.88 ⁵²
19.2	50.775 ²⁵⁷	71.84 ²⁰	47.93 ¹⁰⁸	98.72 ⁷³	49.588 ²⁷⁷	22.61 ⁴⁷	40.250 ¹⁶⁷	22.43 ⁴⁵
Mar. 1.2	50.520 ²⁵⁵	71.14 ⁷⁰	46.89 ¹⁰⁴	97.42 ¹³⁰	49.315 ²⁷³	21.80 ⁸¹	40.082 ¹⁶⁸	22.05 ³⁸
11.2	50.279 ²⁴¹	69.96 ¹¹⁸	45.90 ⁹⁹	95.63 ¹⁷⁹	49.054 ²⁶¹	20.65 ¹¹⁵	39.919 ¹⁶³	21.74 ³¹
21.1	50.060 ²¹⁹	68.34 ¹⁶²	44.99 ⁹¹	93.39 ²²⁴	48.825 ²²⁹	19.23 ¹⁴²	39.775 ¹⁴⁴	21.55 ¹⁹
31.1	49.872 ¹⁸⁸	66.32 ²⁰²	44.19 ⁸⁰	90.70 ²⁶⁹	48.639 ¹⁸⁶	17.61 ¹⁶²	39.657 ¹¹⁸	21.49 ⁶
Apr. 10.1	49.727 ¹⁴⁵	63.93 ²³⁹	43.52 ⁶⁷	87.70 ³⁰⁰	48.505 ¹³⁴	15.85 ¹⁷⁶	39.572 ⁸⁵	21.57 ⁸
20.1	49.630 ⁹⁷	61.23 ²⁷⁰	42.99 ⁵³	84.44 ³²⁶	48.431 ⁷⁴	14.03 ¹⁸²	39.525 ⁴⁷	21.82 ²⁵
30.0	49.586 ⁴⁴	58.27 ²⁹⁶	42.61 ³⁸	80.97 ³⁴⁷	48.422 ⁹	12.26 ¹⁷⁷	39.524 ¹	22.25 ⁴³
May 10.0	49.597 ¹¹	55.12 ³¹⁵	42.40 ²¹	77.37 ³⁶⁰	48.486 ⁶⁴	10.54 ¹⁷²	39.569 ⁴⁵	22.88 ⁶³
20.0	49.665 ⁶⁸	51.84 ³²⁸	42.37 ³	73.71 ³⁶⁶	48.616 ¹³⁰	9.01 ¹⁵³	39.661 ⁹²	23.68 ⁸⁰
30.0	49.791 ¹²⁶	48.51 ³³³	42.50 ¹³	70.13 ³⁵⁸	48.811 ¹⁹⁵	7.69 ¹³²	39.796 ¹³⁵	24.69 ¹⁰¹
June 8.9	49.970 ¹⁷⁹	45.21 ³³⁰	42.81 ³¹	66.66 ³⁴⁷	49.068 ²⁵⁷	6.65 ¹⁰⁴	39.973 ¹⁷⁷	25.85 ¹¹⁶
18.9	50.198 ²²⁸	42.00 ³²¹	43.28 ⁴⁷	63.41 ³²⁵	49.375 ³⁰⁷	5.90 ⁷⁵	40.188 ²¹⁵	27.17 ¹³²
28.9	50.470 ²⁷²	39.00 ³⁰⁰	43.90 ⁶²	60.45 ²⁹⁶	49.725 ³⁵⁰	5.45 ⁴⁵	40.429 ²⁴¹	28.57 ¹⁴⁰
July 8.8	50.778 ³⁰⁸	36.24 ²⁷⁶	44.65 ⁷⁵	57.85 ²⁶⁰	50.109 ³⁸⁴	5.37 ⁸	40.697 ²⁶⁸	30.06 ¹⁴⁹
18.8	51.114 ³³⁶	33.83 ²⁴¹	45.51 ⁸⁶	55.69 ²¹⁶	50.519 ⁴¹⁰	5.60 ²³	40.982 ²⁸⁵	31.58 ¹⁵²
28.8	51.469 ³⁵⁵	31.85 ¹⁹⁸	46.46 ⁹⁵	54.04 ¹⁶⁵	50.942 ⁴²³	6.14 ⁵⁴	41.276 ²⁹⁴	33.08 ¹⁵⁰
Aug. 7.8	51.834 ³⁶⁵	30.33 ¹⁵²	47.46 ¹⁰⁰	52.98 ¹⁰⁶	51.372 ⁴³⁰	6.98 ⁸⁴	41.573 ²⁹⁷	34.53 ¹⁴⁵
17.7	52.200 ³⁶⁶	29.33 ¹⁰⁰	48.50 ¹⁰⁴	52.50 ⁴⁸	51.797 ⁴²⁵	8.12 ¹¹⁴	41.866 ²⁹³	35.86 ¹³³
27.7	52.559 ³⁵⁹	28.89 ⁴⁴	49.54 ¹⁰⁴	52.60 ¹⁰	52.211 ⁴¹⁴	9.47 ¹³⁵	42.152 ²⁸⁶	37.04 ¹¹⁸
Sept. 6.7	52.901 ³⁴²	29.01 ¹²	50.53 ⁹⁹	53.34 ⁷⁴	52.610 ³⁹⁹	11.05 ¹⁵⁸	42.423 ²⁷¹	38.05 ¹⁰¹
16.7	53.221 ³²⁰	29.70 ⁶⁹	51.46 ⁹³	54.71 ¹³⁷	52.982 ³⁷²	12.83 ¹⁷⁸	42.679 ²⁵⁶	38.87 ⁸²
26.6	53.509 ²⁸⁸	30.93 ¹²³	52.29 ⁸³	56.61 ¹⁹⁰	53.326 ³⁴⁴	14.77 ¹⁹⁴	42.913 ²³⁴	39.47 ⁶⁰
Oct. 6.6	53.762 ²⁵³	32.65 ¹⁷²	52.99 ⁷⁰	58.97 ²³⁶	53.637 ³¹¹	16.78 ²⁰¹	43.125 ²¹²	39.85 ³⁸
16.6	53.978 ²¹⁶	34.80 ²¹⁵	53.54 ⁵⁵	61.75 ²⁷⁸	53.912 ²⁷⁵	18.91 ²¹³	43.312 ¹⁸⁷	40.03 ¹⁸
26.5	54.148 ¹⁷⁰	37.30 ²⁵⁰	53.92 ³⁸	64.85 ³¹⁰	54.148 ²³⁶	21.04 ²¹³	43.472 ¹⁶⁰	40.00 ³
Nov. 5.5	54.271 ¹²³	40.02 ²⁷²	54.12 ²⁰	68.12 ³²⁷	54.339 ¹⁹¹	23.20 ²¹⁶	43.604 ¹³²	39.82 ¹⁸
15.5	54.347 ⁷⁶	42.90 ²⁸⁸	54.13 ¹	71.46 ³³⁴	54.483 ¹⁴⁴	25.32 ²¹²	43.706 ¹⁰²	39.51 ³¹
25.5	54.375 ²⁸	45.80 ²⁹⁰	53.94 ¹⁹	74.76 ³³⁰	54.577 ³⁰⁸	27.37 ²⁰⁵	43.779 ⁷³	39.07 ⁴⁴
Dec. 5.4	54.356 ¹⁹	48.61 ²⁸¹	53.57 ³⁷	77.84 ³⁰⁸	54.617 ⁴⁰	29.28 ¹⁹¹	43.817 ³⁸	38.56 ⁵¹
15.4	54.289 ⁶⁷	51.23 ²⁶²	53.03 ⁵⁴	80.64 ²⁸⁰	54.603 ¹⁴	31.03 ¹⁷⁵	43.823 ⁶	38.01 ⁵⁵
25.4	54.178 ¹¹¹	53.58 ²³⁵	52.34 ⁶⁹	83.03 ²³⁹	54.534 ⁶⁹	32.52 ¹⁴⁹	43.794 ²⁹	37.44 ⁵⁷
35.4	54.027 ¹⁵¹	55.56 ¹⁹⁸	51.51 ⁸³	84.94 ¹⁹¹	54.410 ¹²⁴	33.76 ¹²⁴	43.732 ⁶²	36.87 ⁵⁷
Mean Place	51.144	48.45	50.771	73.29	48.964	18.15	40.019	31.99
Sec δ , Tan δ	1.376	-0.945	4.684	-4.576	1.542	+1.174	1.012	+0.154
$D\psi\alpha$, $D\omega\alpha$	+0.042	+0.041	-0.031	+0.198	+0.085	-0.051	+0.064	-0.007
$D\psi\delta$, $D\omega\delta$	+0.26	+0.76	+0.26	+0.76	+0.26	+0.76	+0.25	+0.77

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 H. Camelop. Mag. 4.4		ξ Tauri. Mag. 3.8		f Tauri. Mag. 4.3		ε Eridani. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 22 s	° ' " +59 40 "	h m 3 22 s	° ' " + 9 27 "	h m 3 26 s	° ' " +12 40 "	h m 3 29 s	° ' " - 9 42 "
Jan. 0.4	51.660 214	28.93 144	60.525 81	47.42 57	38.112 82	19.75 45	18.883 92	76.57 123
10.3	51.446 273	30.37 103	60.444 112	46.85 58	38.030 110	19.30 47	18.791 122	77.80 101
20.3	51.173 320	31.40 59	60.332 136	46.29 53	37.920 137	18.83 16	18.669 146	78.81 79
30.3	50.853 354	31.99 12	60.196 155	45.76 50	37.783 157	18.37 47	18.523 161	79.60 55
Feb. 9.3	50.499 369	32.11 36	60.041 168	45.26 45	37.626 170	17.90 48	18.359 174	80.15 31
19.2	50.130 369	31.75 79	59.873 170	44.81 39	37.456 172	17.44 43	18.185 176	80.46 6
Mar. 1.2	49.761 319	30.96 122	59.703 162	44.42 31	37.284 166	17.01 38	18.009 169	80.52 21
11.2	49.412 311	29.74 158	59.541 146	44.11 21	37.118 147	16.63 32	17.840 157	80.31 48
21.1	49.101 256	28.16 204	59.395 120	43.90 10	36.971 124	16.31 22	17.683 130	79.83 72
31.1	48.845 192	26.29 207	59.275 87	43.80 4	36.847 90	16.09 12	17.553 97	79.11 99
Apr. 10.1	48.653 112	24.22 218	59.188 49	43.84 21	36.757 53	15.97 5	17.456 61	78.12 124
20.1	48.541 29	22.04 223	59.139 3	44.05 39	36.704 4	16.02 20	17.395 17	76.88 145
30.0	48.512 59	19.81 216	59.136 43	44.44 57	36.700 40	16.22 39	17.378 22	75.43 167
May 10.0	48.571 145	17.65 204	59.179 90	45.01 77	36.740 90	16.61 55	17.407 74	73.76 185
20.0	48.716 227	15.61 181	59.269 135	45.78 95	36.830 132	17.16 79	17.481 118	71.91 199
30.0	48.943 302	13.80 156	59.404 176	46.73 113	36.962 177	17.95 91	17.599 159	69.92 210
June 8.9	49.245 370	12.24 125	59.580 213	47.86 126	37.139 209	18.89 107	17.758 195	67.82 215
18.9	49.615 425	10.99 90	59.793 242	49.12 138	37.348 244	19.96 122	17.953 228	65.67 215
28.9	50.040 469	10.09 53	60.035 268	50.50 145	37.592 268	21.18 131	18.181 255	63.52 210
July 8.8	50.509 503	9.56 15	60.303 284	51.95 150	37.860 287	22.49 139	18.436 271	61.42 196
18.8	51.012 522	9.41 22	60.587 294	53.45 148	38.147 297	23.88 110	18.710 281	59.46 179
28.8	51.534 533	9.63 63	60.881 297	54.93 142	38.444 300	25.28 139	18.994 291	57.67 158
Aug. 7.8	52.067 529	10.26 95	61.178 296	56.35 133	38.744 300	26.67 129	19.285 288	56.09 127
17.7	52.596 519	11.21 130	61.474 286	57.68 118	39.044 289	27.96 120	19.573 282	54.82 97
27.7	53.115 499	12.51 158	61.760 274	58.86 102	39.333 278	29.16 107	19.855 268	53.85 61
Sept. 6.7	53.614 472	14.09 188	62.034 256	59.88 83	39.611 266	30.23 92	20.123 252	53.24 26
16.7	54.086 437	15.97 207	62.290 236	60.71 61	39.877 210	31.15 73	20.375 232	52.98 11
26.6	54.523 394	18.04 229	62.526 214	61.32 41	40.117 219	31.88 53	20.607 209	53.09 45
Oct. 6.6	54.917 350	20.33 243	62.740 189	61.73 20	40.336 195	32.41 36	20.816 185	53.54 77
16.6	55.267 296	22.76 255	62.929 163	61.93 2	40.531 170	32.77 19	21.001 155	54.31 107
26.5	55.563 240	25.31 261	63.092 136	61.95 14	40.701 143	32.96 4	21.156 126	55.38 128
Nov. 5.5	55.803 176	27.92 261	63.228 105	61.81 29	40.844 113	33.00 9	21.282 95	56.66 144
15.5	55.979 112	30.53 255	63.333 75	61.52 39	40.957 78	32.91 20	21.377 63	58.10 154
25.5	56.091 41	33.08 243	63.408 43	61.13 46	41.035 46	32.71 26	21.440 32	59.64 156
Dec. 5.4	56.132 32	35.51 218	63.451 7	60.67 51	41.081 12	32.45 35	21.472 6	61.20 153
15.4	56.100 105	37.77 200	63.458 26	60.16 54	41.093 23	32.10 39	21.466 40	62.73 145
25.4	55.995 174	39.77 168	63.432 60	59.62 54	41.070 58	31.71 41	21.426 72	64.18 129
35.4	55.821	41.45	63.372	59.08	41.012	31.30	21.354	65.47
Mean Place	49.285	24.41	59.622	54.18	37.162	25.80	18.094	64.48
Sec δ, Tan δ	1.980	+1.709	1.014	+0.167	1.025	+0.225	1.015	-0.171
Dψα, Dωα	+0.096	-0.072	+0.065	-0.007	+0.066	-0.009	+0.058	+0.007
Dψδ, Dωδ	+0.25	+0.77	+0.25	+0.77	+0.25	+0.78	+0.24	+0.79

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^5 Eridani. Mag. 4.3		δ Persei. Mag. 3.1		δ Eridani. Mag. 3.7		ν Persei. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 30	° ' -21 53	h m 3 37	° ' +47 32	h m 3 39	° ' -10 1	h m 3 39	° ' +42 20
	s	"	s	"	s	"	s	"
Jan. 0.4	23.876	40.40	27.816	35.01	34.385	36.07	58.947	12.22
10.3	23.771	41.99	27.689	36.06	34.302	37.32	58.840	13.07
20.3	23.636	43.25	27.514	36.83	34.189	38.38	58.690	13.67
30.3	23.475	44.19	27.302	37.24	34.049	39.23	58.500	13.98
Feb. 9.3	23.295	44.78	27.056	37.31	33.888	39.82	58.283	13.98
19.2	23.105	45.00	26.795	37.01	33.714	40.16	58.047	13.67
Mar. 1.2	22.911	44.86	26.526	36.39	33.535	40.26	57.805	13.10
11.2	22.724	44.39	26.268	35.44	33.360	40.08	57.571	12.23
21.2	22.554	43.55	26.035	34.23	33.199	39.65	57.357	11.14
31.1	22.407	42.38	25.838	32.81	33.060	38.94	57.178	9.88
Apr. 10.1	22.293	40.90	25.689	31.21	32.952	38.00	57.042	8.51
20.1	22.218	39.12	25.597	29.55	32.881	36.79	56.958	7.09
30.0	22.186	37.08	25.568	27.89	32.852	35.35	56.931	5.69
May 10.0	22.201	34.83	25.604	26.30	32.868	33.68	56.964	4.37
20.0	22.264	32.41	25.708	24.83	32.930	31.84	57.059	3.18
30.0	22.374	29.85	25.874	23.54	33.037	29.84	57.214	2.15
June 8.9	22.528	27.22	26.099	22.47	33.186	27.72	57.422	1.37
18.9	22.720	24.60	26.378	21.70	33.372	25.55	57.679	0.83
28.9	22.949	22.04	26.701	21.21	33.593	23.37	57.978	0.55
July 8.9	23.206	19.60	27.059	20.99	33.841	21.25	58.310	0.55
18.8	23.483	17.38	27.445	21.07	34.108	19.23	58.608	0.80
28.8	23.775	15.40	27.850	21.47	34.389	17.38	59.041	1.33
Aug. 7.8	24.075	13.76	28.262	22.14	34.678	15.76	59.422	2.09
17.7	24.375	12.50	28.677	23.09	34.967	14.41	59.805	3.05
27.7	24.669	11.66	29.082	24.22	35.251	13.39	60.180	4.20
Sept. 6.7	24.952	11.26	29.473	25.59	35.526	12.72	60.545	5.51
16.7	25.217	11.31	29.850	27.13	35.784	12.41	60.891	6.94
26.6	25.462	11.80	30.200	28.83	36.026	12.48	61.214	8.48
Oct. 6.6	25.683	12.73	30.520	30.63	36.245	12.90	61.513	10.09
16.6	25.874	14.04	30.809	32.52	36.441	13.66	61.781	11.75
26.6	26.035	15.68	31.064	34.44	36.610	14.69	62.018	13.43
Nov. 5.5	26.165	17.56	31.278	36.40	36.752	15.96	62.219	15.12
15.5	26.262	19.62	31.445	38.35	36.862	17.40	62.380	16.77
25.5	26.323	21.78	31.565	40.25	36.940	18.95	62.499	18.37
Dec. 5.4	26.347	23.93	31.634	42.08	36.986	20.53	62.571	19.87
15.4	26.335	25.99	31.649	43.76	36.995	22.09	62.593	21.26
25.4	26.287	27.91	31.611	45.22	36.969	23.56	62.567	22.48
35.4	26.204	29.58	31.518	46.45	36.907	24.90	62.489	23.49
Mean Place	23.093	25.56	26.077	33.63	33.534	23.94	57.388	12.03
Sec δ , Tan δ	1.078	-0.402	1.482	+1.093	1.015	-0.177	1.353	+0.911
$D\psi\alpha$, $D\omega\alpha$	+0.053	+0.016	+0.085	-0.042	+0.057	+0.007	+0.081	-0.035
$D\psi\delta$, $D\omega\delta$	+0.24	+0.79	+0.23	+0.81	+0.23	+0.82	+0.23	+0.82

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	5 H. Camelop. Mag. 4.7		η Tauri. (Alcyone.) Mag. 3.0		τ ⁶ Eridani. Mag. 4.3		g Eridani. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 42 s	° ' " +71 5 "	h m 3 42 s	° ' " +23 51 "	h m 3 43 s	° ' " -23 28 "	h m 3 46 s	° ' " -36 25 "
Jan. 0.4	16.18	52.81	55.369	61.24	32.936	47.27	35.323	74.59
10.4	15.84 ³⁴	54.84 ²⁰³	55.293 ⁷⁶	61.28 ⁴	32.836 ¹⁰⁰	48.96 ¹⁶⁹	35.187 ¹³⁶	76.55 ¹⁹⁶
20.3	15.40 ⁴⁴	56.42 ¹⁵⁸	55.184 ¹⁰⁹	61.24 ⁴	32.702 ¹³⁴	50.35 ¹³⁹	35.017 ¹⁷⁰	78.14 ¹⁵⁹
30.3	14.88 ⁵²	57.54 ¹¹²	55.042 ¹⁴²	61.05 ¹⁹	32.540 ¹⁶²	51.42 ¹⁰⁷	34.816 ²⁰¹	79.29 ¹¹⁵
Feb. 9.3	14.31 ⁵⁷	58.10 ⁵⁶	54.876 ¹⁸⁶	60.78 ²⁷	32.357 ¹⁸³	52.10 ⁶⁸	34.594 ²²²	79.99 ⁷⁰
19.2	13.70 ⁶¹	58.11 ¹	54.693 ¹⁸³	60.39 ³⁹	32.161 ¹⁹⁶	52.43 ³³	34.358 ²³⁶	80.20 ²¹
Mar. 1.2	13.09 ⁵⁹	57.61 ⁵⁰	54.505 ¹⁸⁸	59.90 ⁴⁹	31.960 ²⁰¹	52.35 ⁸	34.116 ²⁴²	79.96 ²⁴
11.2	12.50 ⁵⁴	56.56 ¹⁰⁵	54.322 ¹⁸³	59.33 ⁵⁷	31.763 ¹⁹⁷	51.93 ⁴²	33.880 ²³⁶	79.27 ⁶⁹
21.2	11.96 ⁴⁵	55.06 ¹⁵⁰	54.151 ¹⁷¹	58.72 ⁶¹	31.580 ¹⁸³	51.14 ⁷⁹	33.659 ²²¹	78.12 ¹¹⁵
31.1	11.51 ³⁷	53.14 ¹⁹²	54.011 ¹⁴⁰	58.09 ⁶³	31.421 ¹⁵⁹	49.99 ¹¹⁵	33.464 ¹⁹⁵	76.58 ¹⁵⁴
Apr. 10.1	11.14 ²⁵	50.95 ²¹⁹	53.901 ¹¹⁰	57.50 ⁵⁹	31.293 ¹²⁸	48.52 ¹⁴⁷	33.302 ¹⁶²	74.67 ¹⁹¹
20.1	10.89 ¹²	48.49 ²⁴⁶	53.834 ⁶⁷	56.97 ⁵³	31.202 ⁹¹	46.75 ¹⁷⁷	33.182 ¹²⁰	72.40 ²²⁷
30.1	10.77 ⁰	45.91 ²⁵⁸	53.812 ²²	56.56 ⁴¹	31.155 ⁴⁷	44.72 ²⁰³	33.110 ⁷²	69.84 ²⁵⁶
May 10.0	10.77 ¹⁴	43.32 ²⁵⁹	53.840 ²⁸	56.26 ¹⁵	31.155 ⁰	42.43 ²²⁹	33.088 ²²	67.04 ²⁸⁰
20.0	10.91 ²⁶	40.79 ²³⁶	53.921 ¹²⁶	56.11 ⁶	31.203 ⁹⁵	39.97 ²⁴⁶	33.120 ⁸²	64.07 ³⁰⁸
30.0	11.17 ³⁸	38.43 ²¹⁸	54.047 ¹⁷³	56.17 ²⁴	31.298 ¹³⁹	37.39 ²⁶⁶	33.202 ¹³⁴	60.99 ³¹³
June 8.9	11.55 ⁴⁹	36.25 ¹⁸⁸	54.220 ²¹³	56.41 ⁴¹	31.437 ¹⁸¹	34.73 ²⁶⁷	33.336 ¹⁸¹	57.86 ³⁰⁸
18.9	12.04 ⁵⁸	34.37 ¹⁵⁶	54.433 ²¹⁸	56.82 ⁶³	31.618 ²¹⁹	32.06 ²⁶³	33.517 ²²³	54.78 ²⁹⁶
28.9	12.62 ⁶⁵	32.81 ¹¹⁵	54.681 ²⁷⁶	57.45 ⁷⁶	31.837 ²⁴⁶	29.43 ²⁴⁷	33.740 ²⁵⁹	51.82 ²⁷⁸
July 8.9	13.27 ⁷²	31.66 ⁷⁵	54.957 ²⁹⁶	58.21 ⁹¹	32.083 ²⁷¹	26.96 ²²⁸	33.999 ²⁸⁷	49.04 ²⁵¹
18.8	13.99 ⁷⁶	30.91 ³³	55.253 ³¹¹	59.12 ¹⁰²	32.354 ²⁸⁹	24.68 ²⁰³	34.286 ³⁰⁹	46.53 ²¹⁶
28.8	14.75 ⁷⁹	30.58 ⁹	55.564 ³¹⁶	60.14 ¹¹⁰	32.643 ²⁹⁸	22.65 ¹⁶⁸	34.595 ³²⁴	44.37 ¹⁷⁵
Aug. 7.8	15.54 ⁸⁰	30.67 ⁵⁵	55.880 ³¹⁷	61.24 ¹¹⁴	32.941 ³⁰¹	20.97 ¹³¹	34.919 ³²⁹	42.62 ¹²⁸
17.8	16.34 ⁷⁹	31.22 ⁹¹	56.197 ³¹⁴	62.38 ¹¹⁵	33.242 ²⁹⁷	19.66 ⁸⁸	35.248 ³²⁷	41.34 ⁷⁸
27.7	17.13 ⁷⁷	32.13 ¹²⁹	56.511 ³⁰¹	63.53 ¹¹¹	33.539 ²⁸⁹	18.78 ⁴¹	35.575 ³²⁰	40.56 ²³
Sept. 6.7	17.90 ⁷⁴	33.42 ¹⁷⁰	56.812 ²⁸⁷	64.64 ¹⁰⁹	33.828 ²⁷³	18.37 ⁵	35.895 ³⁰³	40.33 ³¹
16.7	18.64 ⁷⁰	35.12 ²⁰³	57.099 ²⁷¹	65.73 ¹⁰¹	34.101 ²⁵⁴	18.42 ⁵²	36.198 ²⁸¹	40.64 ⁸⁵
26.6	19.34 ⁶⁴	37.15 ²²⁹	57.370 ²⁴⁶	66.74 ⁹³	34.355 ²³¹	18.94 ⁹⁴	36.479 ²⁵⁵	41.49 ¹³⁶
Oct. 6.6	19.98 ⁵⁷	39.44 ²⁵⁵	57.616 ²²⁴	67.67 ⁸²	34.586 ²⁰⁴	19.88 ¹⁷¹	36.734 ²²²	42.85 ¹⁸³
16.6	20.55 ⁴⁹	41.99 ²⁷⁸	57.840 ¹⁹⁸	68.49 ⁷⁴	34.790 ¹⁷⁵	21.24 ¹³⁶	36.956 ¹⁸⁹	44.68 ²²⁰
26.6	21.04 ⁴¹	44.77 ²⁹³	58.038 ¹⁷⁰	69.23 ⁶³	34.965 ¹⁴³	22.95 ¹⁹⁶	37.145 ¹⁴⁹	46.88 ²⁴⁹
Nov. 5.5	21.45 ³⁰	47.70 ³⁰⁰	58.208 ¹⁴⁰	69.86 ⁵⁵	35.108 ¹⁰⁸	24.91 ²¹⁸	37.294 ¹⁰⁹	49.37 ²⁶⁸
15.5	21.75 ¹⁹	50.70 ³⁰²	58.348 ¹⁰⁴	70.41 ⁴⁷	35.216 ⁷⁵	27.09 ²²⁶	37.403 ⁶⁵	52.05 ²⁸⁰
25.5	21.94 ⁸	53.72 ²⁹⁹	58.452 ⁶⁷	70.88 ³⁸	35.289 ³¹	29.35 ²²⁰	37.468 ²¹	54.85 ²⁷⁷
Dec. 5.5	22.02 ³	56.71 ²⁸⁰	58.519 ³¹	71.26 ³¹	35.324 ³	31.63 ²²⁰	37.489 ²²	57.62 ²⁶⁶
15.4	21.99 ¹⁶	59.51 ²⁵⁷	58.550 ¹²	71.57 ²²	35.321 ³⁹	33.83 ²⁰⁷	37.467 ⁶⁸	60.28 ²⁴⁵
25.4	21.83 ²⁷	62.08 ²²⁷	58.538 ⁴⁸	71.79 ¹²	35.282 ⁷⁸	35.90 ¹⁸³	37.399 ¹⁰⁹	62.73 ²¹⁶
35.4	21.56	64.35	58.490	71.91	35.204	37.73	37.290	64.89
Mean Place	12.213	48.37	54.217	65.22	32.079	32.07	34.395	56.87
Sec δ, Tan δ	3.086	+2.920	1.094	+0.442	1.090	-0.434	1.243	-0.738
Dψα, Dωα	+0.125	-0.110	+0.071	-0.017	+0.052	+0.016	+0.045	+0.027
Dψδ, Dωδ	+0.23	+0.82	+0.22	+0.83	+0.22	+0.83	+0.22	+0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydri. Mag. 3.2		ζ Persel. Mag. 2.9		θ H. Camelop. Mag. 5.2		ϵ Persel. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 48	° ' -74 28	h m 3 49	° ' +31 39	h m 3 50	° ' +60 52	h m 3 52	° ' +39 47
	s	"	s	"	s	"	s	"
Jan. 0.4	27.30	52.93 ²⁰⁶	18.549	19.59 ⁴⁰	36.11	68.06 ¹⁷⁰	42.430	18.44 ⁸⁰
10.4	26.65 ⁶⁵	54.99 ¹⁵⁰	18.472 ⁷⁷	19.99 ²⁶	35.93 ¹⁸	69.76 ¹³³	42.340 ⁹⁰	19.24 ⁵⁹
20.3	25.92 ⁷³	56.49 ⁹⁷	18.353 ¹¹⁹	20.25 ⁸	35.68 ²⁵	71.09 ⁹³	42.208 ¹³²	19.83 ³¹
30.3	25.12 ⁸⁰	57.46 ³⁸	18.200 ¹⁵³	20.33 ¹⁴	35.36 ³²	72.02 ⁴⁷	42.035 ²⁰⁴	20.14 ⁷
Feb. 9.3	24.27 ⁸⁵	57.84 ²⁰	18.023 ¹⁷⁷	20.19 ³¹	35.01 ³⁵	72.49 ⁰	41.831 ²²³	20.21 ²²
19.2	23.40 ⁸⁶	57.64 ⁷⁶	17.822 ²⁰⁵	19.88 ⁴⁸	34.62 ³⁹	72.49 ⁴⁷	41.608 ²³²	19.99 ⁴⁸
Mar. 1.2	22.54 ⁸⁴	56.88 ¹³⁴	17.617 ²⁰²	19.40 ⁶⁵	34.23 ³⁸	72.02 ⁹⁰	41.376 ²²⁷	19.51 ⁷⁴
11.2	21.70 ⁷⁸	55.54 ¹⁸¹	17.415 ¹⁸⁴	18.75 ⁷⁹	33.85 ³⁵	71.12 ¹³¹	41.149 ²¹³	18.77 ⁹⁰
21.2	20.92 ⁷¹	53.73 ²²⁶	17.231 ¹⁶²	17.96 ⁸⁴	33.50 ³¹	69.81 ¹⁶⁵	40.936 ¹⁷⁹	17.87 ¹¹⁰
31.1	20.21 ⁶²	51.47 ²⁶⁶	17.069 ¹²¹	17.12 ⁹⁰	33.19 ²⁴	68.16 ¹⁹¹	40.757 ¹⁴²	16.77 ¹²²
Apr. 10.1	19.59 ⁵¹	48.81 ²⁹⁹	16.948 ⁷⁹	16.22 ⁸⁹	32.95 ¹⁶	66.25 ²⁰⁸	40.615 ⁹⁵	15.55 ¹²⁶
20.1	19.08 ⁴⁰	45.82 ³²⁵	16.869 ³¹	15.33 ⁸⁴	32.79 ⁸	64.17 ²¹⁹	40.520 ³⁹	14.29 ¹²³
30.1	18.68 ²⁶	42.57 ³⁵⁰	16.838 ²⁴	14.49 ⁷⁶	32.71 ¹	61.98 ²¹⁹	40.481 ²⁰	13.06 ¹¹⁸
May 10.0	18.42 ¹²	39.07 ³⁵⁷	16.862 ⁷⁶	13.73 ⁶⁰	32.72 ⁹	59.79 ²¹⁵	40.501 ⁷⁷	11.88 ¹⁰⁶
20.0	18.30 ¹	35.50 ³⁶⁰	16.938 ¹²⁸	13.13 ⁴¹	32.81 ¹⁹	57.64 ¹⁹⁷	40.578 ¹³⁵	10.82 ⁹⁰
30.0	18.31 ¹⁶	31.90 ³⁵⁴	17.066 ¹⁷⁸	12.72 ²⁶	33.00 ²⁶	55.67 ¹⁷⁷	40.713 ¹⁹⁰	9.92 ⁷³
June 8.9	18.47 ²⁹	28.36 ³¹³	17.244 ²²²	12.46 ²	33.26 ³⁴	53.90 ¹⁵³	40.903 ²³⁷	9.19 ⁴⁹
18.9	18.76 ⁴²	24.93 ³¹⁷	17.466 ²⁵⁸	12.44 ¹⁷	33.60 ⁴⁰	52.37 ¹²⁰	41.140 ²⁷⁸	8.70 ²⁴
28.9	19.18 ⁵⁴	21.76 ²⁸⁸	17.724 ²⁸⁹	12.61 ⁴⁰	34.00 ⁴⁶	51.17 ⁸⁸	41.418 ³¹¹	8.46 ¹
July 8.9	19.72 ⁶³	18.88 ²¹⁹	18.013 ³¹²	13.01 ⁵⁷	34.46 ⁵⁰	50.29 ⁵¹	41.729 ³³⁹	8.45 ²²
18.8	20.35 ⁷²	16.39 ²⁰⁴	18.325 ³²⁹	13.58 ⁷⁶	34.96 ⁵²	49.78 ¹⁶	42.068 ³⁵⁷	8.67 ⁴⁹
28.8	21.07 ⁷⁹	14.35 ¹⁵²	18.654 ³³⁶	14.34 ⁸⁹	35.48 ⁵⁵	49.62 ²¹	42.425 ³⁶⁷	9.16 ⁶⁸
Aug. 7.8	21.86 ⁸³	12.83 ⁹³	18.990 ³³⁹	15.23 ¹⁰¹	36.03 ⁵⁷	49.83 ⁵⁷	42.792 ³⁷¹	9.84 ⁸⁵
17.8	22.69 ⁸⁴	11.90 ³²	19.329 ³³³	16.24 ¹¹⁰	36.60 ⁵³	50.40 ⁹⁰	43.163 ³⁶⁵	10.69 ¹⁰²
27.7	23.53 ⁸³	11.58 ³⁰	19.662 ³²³	17.34 ¹¹³	37.13 ⁵⁴	51.30 ¹²⁴	43.528 ³⁵⁷	11.71 ¹¹⁸
Sept. 6.7	24.36 ⁷⁹	11.88 ⁹⁵	19.985 ³⁰⁹	18.47 ¹¹⁹	37.67 ⁵¹	52.54 ¹⁵¹	43.885 ³⁴⁰	12.89 ¹²⁶
16.7	25.15 ⁷³	12.83 ¹⁵¹	20.294 ²⁹⁶	19.66 ¹¹⁷	38.18 ⁴⁹	54.05 ¹⁷⁸	44.225 ³²⁵	14.15 ¹³⁸
26.6	25.88 ⁶⁴	14.34 ²⁰⁷	20.590 ²⁶⁹	20.83 ¹¹⁹	38.67 ⁴⁵	55.83 ²⁰⁰	44.550 ³⁰¹	15.53 ¹⁴¹
Oct. 6.6	26.52 ⁵⁴	16.41 ²⁵⁴	20.859 ²⁴⁷	22.02 ¹¹²	39.12 ⁴¹	57.83 ²²¹	44.851 ²⁷²	16.94 ¹⁴⁷
16.6	27.06 ⁴²	18.95 ²⁹⁴	21.106 ²¹⁹	23.14 ¹¹¹	39.53 ³⁶	60.04 ²³⁶	45.123 ²¹³	18.41 ¹⁴⁵
26.6	27.48 ²⁸	21.89 ³¹⁸	21.325 ¹⁹⁰	24.25 ¹⁰⁶	39.89 ³⁰	62.40 ²⁴⁸	45.366 ²¹¹	19.86 ¹⁴⁹
Nov. 5.5	27.76 ¹²	25.07 ³³⁶	21.515 ¹⁵³	25.31 ⁹⁹	40.19 ²⁴	64.88 ²⁵⁵	45.577 ¹⁷²	21.35 ¹⁴⁷
15.5	27.88 ²	28.43 ³⁴⁰	21.668 ¹¹⁹	26.30 ⁹⁸	40.43 ¹⁷	67.43 ²⁵⁴	45.749 ¹³⁴	22.82 ¹⁴⁰
25.5	27.86 ¹⁸	31.83 ³³⁰	21.787 ⁸⁰	27.23 ⁸⁷	40.60 ²	69.97 ²⁶⁰	45.883 ⁸⁸	24.22 ¹³⁵
Dec. 5.5	27.68 ³²	35.13 ³⁰⁶	21.867 ³⁸	28.10 ⁷⁷	40.70 ¹	72.47 ²³⁷	45.971 ⁴¹	25.57 ¹²⁴
15.4	27.36 ⁴⁵	38.19 ²⁷⁵	21.905 ⁹	28.87 ⁶⁵	40.72 ⁶	74.84 ²²⁰	46.012 ¹²	26.81 ¹¹⁰
25.4	26.91 ⁵⁸	40.94 ²³³	21.896 ⁵⁰	29.52 ⁵³	40.66 ¹⁴	77.04 ¹⁹³	46.000 ⁵⁶	27.91 ⁹⁷
35.4	26.33	43.27	21.846	30.05	40.52	78.97	45.944	28.88
Mean Place	24.754	30.94	17.236	22.17	33.520	65.52	40.909	19.58
Sec δ , Tan δ	3.736	-3.600	1.175	+0.617	2.055	+1.795	1.301	+0.833
$D\alpha$, $D_{\alpha\alpha}$	-0.019	+0.130	+0.075	-0.022	+0.101	-0.064	+0.080	-0.029
$D\delta$, $D_{\delta\delta}$	+0.22	+0.84	+0.21	+0.84	+0.21	+0.84	+0.21	+0.85

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Persei. Mag. 4.0		γ Eridani. Mag. 3.2		λ Tauri. Var. 3.3-4.2		δ Reticuli. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 53 s	° ' " +35 34 "	h m 3 54 s	° ' " -13 43 "	h m 3 56 s	° ' " +12 16 "	h m 3 57 s	° ' " -61 36 "
Jan. 0.4	59.271	12.44 61	27.094	49.00 146	25.788	18.71 44	32.78 30	81.86 228
10.4	59.192 79	13.05 44	27.014 80	50.46 125	25.727 94	18.27 44	32.48 36	84.14 177
20.3	59.070 122	13.49 21	26.903 111	51.71 98	25.631 127	17.83 44	32.12 40	85.91 124
30.3	58.912 158	13.70 —	26.760 143	52.69 73	25.506 152	17.39 41	31.72 44	87.15 67
Feb. 9.3	58.722 190	13.69 1	26.599 161	53.42 42	25.354 169	16.98 39	31.28 46	87.82 10
19.3	58.513 209	13.45 24	26.421 178	53.84 11	25.185 178	16.59 35	30.82 46	87.92 47
Mar. 1.2	58.296 217	12.99 46	26.235 186	53.95 —	25.007 178	16.24 32	30.36 45	87.45 101
11.2	58.080 216	12.33 66	26.050 185	53.78 17	24.830 177	15.92 26	29.91 43	86.44 152
21.2	57.883 197	11.49 84	25.879 171	53.31 47	24.665 165	15.66 17	29.48 39	84.92 199
31.1	57.711 172	10.52 97	25.727 152	52.55 76	24.523 112	15.49 6	29.09 34	82.93 242
Apr. 10.1	57.578 133	9.49 103	25.606 121	51.49 106	24.410 77	15.43 —	28.75 28	80.51 278
20.1	57.489 89	8.42 107	25.518 88	50.20 129	24.333 32	15.50 7	28.47 20	77.73 311
30.1	57.452 37	7.40 102	25.473 45	48.64 156	24.301 12	15.70 20	28.27 13	74.62 332
May 10.0	57.470 18	6.43 93	25.473 0	46.85 179	24.313 37	16.07 54	28.14 4	71.30 350
20.0	57.544 74	5.60 83	25.518 45	44.85 200	24.373 60	16.61 70	28.10 3	67.80 357
30.0	57.673 129	4.92 68	25.609 91	42.74 211	24.479 106	17.31 —	28.13 —	64.23 —
June 8.9	57.852 179	4.45 47	25.742 133	40.49 225	24.628 119	17.31 86	28.13 12	64.23 357
18.9	58.078 226	4.45 28	25.742 174	40.49 225	24.628 188	18.17 100	28.25 19	60.66 347
28.9	58.343 265	4.17 3	25.916 208	38.20 229	24.816 222	19.17 112	28.44 27	57.19 330
July 8.9	58.641 298	4.14 17	26.124 235	35.91 222	25.038 219	20.29 121	28.71 31	53.89 303
18.8	58.963 322	4.31 39	26.359 260	33.69 210	25.287 272	21.50 127	29.05 30	50.86 268
28.8	59.302 339	4.70 59	26.619 277	31.59 190	25.559 287	22.77 128	29.44 44	48.18 225
Aug. 7.8	59.652 350	5.29 77	26.896 288	29.69 164	25.846 235	24.05 126	29.88 47	45.93 175
17.8	60.003 351	6.06 92	27.184 290	28.05 136	26.141 237	25.31 118	30.35 49	44.18 120
27.7	60.352 349	6.98 103	27.474 288	26.69 101	26.438 233	26.49 108	30.84 51	42.98 59
37.7	60.701 338	8.01 112	27.762 281	25.68 61	26.731 286	27.57 95	31.35 49	42.39 4
Sept. 6.7	60.690 325	9.13 120	28.043 268	25.07 22	27.017 275	28.52 77	31.84 48	42.43 66
16.7	61.015 308	10.33 124	28.311 252	24.85 18	27.292 260	29.29 59	32.32 44	43.09 128
26.6	61.323 285	11.57 128	28.563 230	25.03 57	27.552 210	29.88 40	32.76 40	44.37 185
Oct. 6.6	61.608 261	12.85 127	28.793 211	25.60 91	27.792 218	30.28 25	33.16 31	46.22 235
16.6	61.869 232	14.12 126	29.004 181	26.51 126	28.010 196	30.53 6	33.50 28	48.57 278
26.6	62.101 202	15.38 124	29.185 157	27.77 149	28.206 163	30.59 8	33.78 21	51.35 310
Nov. 5.5	62.303 167	16.62 122	29.342 122	29.26 168	28.375 142	30.51 20	33.99 13	54.45 330
15.5	62.470 129	17.84 116	29.464 90	30.94 182	28.517 109	30.31 23	34.12 5	57.75 337
25.5	62.599 87	19.00 108	29.554 56	32.76 185	28.626 78	30.02 36	34.17 3	61.12 333
Dec. 5.5	62.686 41	20.08 101	29.610 19	34.61 181	28.704 40	29.66 40	34.14 12	64.45 316
15.4	62.727 2	21.09 89	29.629 16	36.42 170	28.744 3	29.26 42	34.02 19	67.61 288
25.4	62.725 50	21.98 74	29.613 56	38.12 157	28.747 36	28.84 43	33.83 26	70.49 249
35.4	62.675 —	22.72 —	29.557 —	39.69 —	28.711 —	28.41 —	33.57 —	72.98 —
Mean Place	57.858	14.50	26.182	35.88	24.735	25.95	31.219	61.11
Sec δ, Tan δ	1.229	+0.715	1.029	-0.244	1.023	+0.218	2.104	-1.851
Dψα, Dωα	+0.077	-0.025	+0.056	+0.008	+0.066	-0.007	+0.019	+0.063
Dψδ, Dωδ	+0.21	+0.85	+0.21	+0.85	+0.20	+0.86	+0.20	+0.86

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Tauri. Mag. 3.9		Λ Tauri. Mag. 4.5		ϵ Persei. Mag. 4.0		ρ Tauri. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 3 59	° ' + 5 46	h m 4 0	° ' +21 52	h m 4 3	° ' +47 30	h m 4 6	° ' +26 16
	s	"	s	"	s	"	s	"
Jan. 0.4	4.531	27.31	9.581	16.51	5.755	29.60	9.540	47.63
10.4	4.472	26.58	9.522	16.50	5.655	30.80	9.482	47.83
20.3	4.378	25.91	9.425	16.42	5.505	31.75	9.385	47.94
30.3	4.253	25.31	9.293	16.25	5.308	32.41	9.250	47.95
Feb. 9.3	4.103	24.81	9.133	16.02	5.076	32.70	9.086	47.83
19.3	3.936	24.40	8.955	15.70	4.816	32.67	8.901	47.57
Mar. 1.2	3.760	24.08	8.768	15.32	4.544	32.31	8.705	47.21
11.2	3.585	23.89	8.581	14.86	4.275	31.60	8.510	46.74
21.2	3.421	23.80	8.406	14.38	4.024	30.63	8.326	46.18
31.1	3.277	23.87	8.254	13.89	3.804	29.38	8.164	45.58
Apr. 10.1	3.162	24.08	8.133	13.43	3.630	27.97	8.035	44.95
20.1	3.084	24.47	8.052	13.02	3.508	26.45	7.945	44.34
30.1	3.047	25.02	8.016	12.70	3.445	24.86	7.901	43.80
May 10.0	3.055	25.76	8.028	12.51	3.447	23.29	7.907	43.36
20.0	3.109	26.67	8.089	12.47	3.516	21.79	7.964	43.04
30.0	3.207	27.74	8.198	12.58	3.650	20.42	8.071	42.89
June 9.0	3.348	28.95	8.353	12.87	3.816	19.26	8.225	42.90
18.9	3.528	30.30	8.550	13.33	4.094	18.29	8.423	43.09
28.9	3.742	31.74	8.781	13.95	4.392	17.58	8.657	43.45
July 8.9	3.984	33.20	9.042	14.72	4.731	17.15	8.923	43.97
18.8	4.247	34.69	9.327	15.60	5.100	16.99	9.212	44.65
28.8	4.526	36.15	9.628	16.57	5.494	17.10	9.519	45.44
Aug. 7.8	4.813	37.53	9.937	17.60	5.902	17.47	9.836	46.32
17.8	5.105	38.76	10.249	18.65	6.314	18.10	10.158	47.26
27.7	5.393	39.83	10.558	19.68	6.726	18.95	10.476	48.24
Sept. 6.7	5.673	40.70	10.859	20.68	7.130	20.02	10.789	49.22
16.7	5.942	41.34	11.149	21.61	7.520	21.29	11.090	50.18
26.7	6.197	41.74	11.424	22.46	7.892	22.69	11.377	51.10
Oct. 6.6	6.435	41.90	11.680	23.20	8.237	24.23	11.647	51.96
16.6	6.650	41.82	11.915	23.84	8.556	25.89	11.894	52.76
26.6	6.842	41.56	12.125	24.38	8.841	27.62	12.118	53.49
Nov. 5.5	7.009	41.10	12.311	24.85	9.091	29.43	12.315	54.15
15.5	7.148	40.50	12.466	25.22	9.298	31.25	12.481	54.76
25.5	7.256	39.80	12.588	25.51	9.458	33.08	12.613	55.32
Dec. 5.5	7.332	39.03	12.674	25.73	9.564	34.87	12.709	55.81
15.4	7.372	38.26	12.722	25.90	9.618	36.56	12.764	56.25
25.4	7.373	37.48	12.730	26.02	9.613	38.11	12.777	56.62
35.4	7.338	36.73	12.697	26.08	9.552	39.48	12.748	56.90
Mean Place	3.521	36.11	8.403	21.76	3.938	30.03	8.278	52.23
Sec δ , Tan δ	1.005	+0.101	1.078	+0.401	1.480	+1.092	1.115	+0.494
$D\psi\alpha$, $D\omega\alpha$	+0.063	-0.003	+0.070	-0.013	+0.086	-0.036	+0.073	-0.016
$D\psi\delta$, $D\omega\delta$	+0.20	+0.86	+0.20	+0.87	+0.19	+0.87	+0.19	+0.88

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α^1 Eridani. Mag. 4.1		μ Tauri. Mag. 4.3		α Horologii. Mag. 3.8		α Retiuli. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 8	° ' " - 7 2	h m 4 11	° ' " + 8 41	h m 4 11	° ' " -42 28	h m 4 13	° ' " -62 39
	s	"	s	"	s	"	s	"
Jan. 0.4	7.335	26.01	22.151	53.74	28.165	80.26	27.50	78.97
10.4	7.273	27.28	22.103	53.14	28.025	82.54	27.20	81.44
20.3	7.176	28.38	22.016	52.56	27.843	84.44	26.84	83.37
30.3	7.050	29.31	21.896	52.04	27.624	85.88	26.42	84.80
Feb. 9.3	6.895	30.01	21.750	51.59	27.376	86.84	25.97	85.70
19.3	6.725	30.47	21.583	51.20	27.109	87.30	25.49	86.02
Mar. 1.2	6.545	30.72	21.406	50.89	26.832	87.26	25.00	85.77
11.2	6.362	30.70	21.227	50.66	26.557	86.70	24.52	84.97
21.2	6.190	30.44	21.058	50.52	26.294	85.69	24.06	83.65
31.2	6.036	29.96	20.907	50.49	26.054	84.21	23.63	81.84
Apr. 10.1	5.912	29.22	20.784	50.58	25.847	82.34	23.26	79.58
20.1	5.821	28.25	20.697	50.82	25.681	80.07	22.94	76.93
30.1	5.768	27.05	20.649	51.20	25.564	77.49	22.69	73.95
May 10.0	5.761	25.66	20.647	51.75	25.498	74.64	22.53	70.72
20.0	5.796	24.06	20.691	52.47	25.490	71.57	22.44	67.29
30.0	5.878	22.28	20.780	53.34	25.536	68.38	22.44	63.74
June 9.0	6.003	20.39	20.913	54.35	25.638	65.11	22.52	60.17
18.9	6.166	18.43	21.086	55.51	25.793	61.86	22.69	56.67
28.9	6.365	16.42	21.293	56.76	25.995	58.71	22.94	53.30
July 8.9	6.591	14.44	21.528	58.07	26.241	55.75	23.25	50.17
18.9	6.843	12.53	21.789	59.41	26.522	53.05	23.63	47.37
28.8	7.113	10.75	22.065	60.74	26.831	50.71	24.06	44.99
Aug. 7.8	7.393	9.17	22.351	62.01	27.162	48.78	24.54	43.07
17.8	7.680	7.84	22.642	63.17	27.507	47.33	25.03	41.72
27.7	7.965	6.79	22.932	64.20	27.855	46.42	25.55	40.95
Sept. 6.7	8.244	6.06	23.217	65.06	28.200	46.07	26.06	40.80
16.7	8.512	5.66	23.493	65.71	28.534	46.31	26.56	41.30
26.7	8.769	5.63	23.755	66.16	28.851	47.11	27.03	42.41
Oct. 6.6	9.007	5.94	24.001	66.39	29.141	48.48	27.46	44.11
16.6	9.227	6.59	24.228	66.41	29.402	50.35	27.84	46.35
26.6	9.421	7.51	24.433	66.24	29.627	52.66	28.16	49.04
Nov. 5.6	9.591	8.68	24.614	65.92	29.811	55.31	28.40	52.09
15.5	9.730	10.03	24.767	65.46	29.950	58.20	28.56	55.37
25.5	9.837	11.48	24.889	64.91	30.041	61.24	28.64	58.78
Dec. 5.5	9.911	13.01	24.979	64.30	30.082	64.29	28.64	62.17
15.4	9.950	14.54	25.031	63.66	30.073	67.25	28.55	65.43
25.4	9.953	15.99	25.045	63.02	30.011	70.02	28.37	68.45
35.4	9.917	17.34	25.021	62.40	29.904	72.51	28.12	71.13
Mean Place	6.354	14.26	21.080	62.23	26.997	62.18	25.667	58.79
Sec δ , Tan δ	1.008	-0.124	1.012	+0.153	1.356	-0.916	2.178	-1.935
$D\psi\alpha$, $D\omega\alpha$	+0.058	+0.004	+0.065	-0.005	+0.040	+0.028	+0.015	+0.058
$D\psi\delta$, $D\omega\delta$	+0.19	+0.88	+0.18	+0.89	+0.18	+0.89	+0.18	+0.89

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tauri. Mag. 3.9		δ Tauri. Mag. 3.9		ν^5 Eridani. Mag. 4.1		δ Mensæ. Mag. 5.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 15	° ' " +15 26	h m 4 18	° ' " +17 21	h m 4 21	° ' " -34 11	h m 4 22	° ' " -80 23
	s	"	s	"	s	"	s	"
Jan. 0.4	25.695	27.01	30.672	40.19	9.782	58.58	73.54	64.52
10.4	25.650 45	26.71 30	30.629 43	39.98 21	9.681 101	60.79 221	72.55 99	66.90 238
20.3	25.565 85	26.41 30	30.547 82	39.76 22	9.540 141	62.65 186	71.41 114	68.81 191
30.3	25.446 119	26.10 31	30.426 121	39.51 25	9.362 178	64.11 146	70.13 128	70.19 138
Feb. 9.3	25.299 147	25.78 32	30.278 148	39.25 26	9.154 208	65.14 103	68.75 138	71.03 81
	171	32	171	29	228	58	145	28
19.3	25.128	25.46	30.107	38.96	8.926	65.72	67.30	71.31
Mar. 1.2	24.946 182	25.15 31	29.924 183	38.66 30	8.687 239	65.84 12	65.84 146	71.02 21
11.2	24.763 183	24.84 31	29.739 185	38.33 33	8.447 210	65.51 33	64.41 143	70.20 82
21.2	24.588 175	24.55 29	29.561 178	38.01 32	8.215 232	64.73 78	63.02 139	68.86 131
31.2	24.433 155	24.32 23	29.402 159	37.72 29	8.003 212	63.54 119	61.72 130	67.04 182
	127	17	129	24	181	159	118	221
Apr. 10.1	24.306 93	24.15 9	29.273 94	37.48 16	7.819 117	61.95 194	60.54 102	64.80 263
20.1	24.213 49	24.06 3	29.179 53	37.32 6	7.672 104	60.01 227	59.52 86	62.17 273
30.1	24.164 4	24.09 17	29.126 8	37.26 6	7.568 56	57.74 255	58.66 67	59.24 318
May 10.0	24.160 44	24.26 31	29.118 43	37.32 20	7.512 6	55.19 276	57.99 45	56.06 337
20.0	24.204 90	24.57 46	29.161 89	37.52 35	7.506 46	52.43 292	57.54 23	52.69 346
30.0	24.294	25.03	29.250	37.87	7.552	49.51	57.31	49.23
June 9.0	24.429 135	25.64 61	29.383 133	38.36 49	7.648 96	46.49 302	57.30 1	45.74 349
18.9	24.605 176	26.41 77	29.558 175	39.00 64	7.791 143	43.46 303	57.51 21	42.31 343
28.9	24.817 212	27.30 89	29.768 210	39.77 77	7.977 186	40.48 298	57.94 43	39.04 327
July 8.9	25.057 240	28.28 98	30.009 241	40.63 86	8.202 225	37.63 285	58.57 63	36.01 303
	266	106	267	96	258	261	82	271
18.9	25.323	29.34	30.276	41.59	8.460	35.02	59.39	33.30
28.8	25.606 283	30.44 110	30.560 284	42.61 102	8.743 283	32.68 234	60.38 99	31.00 230
Aug. 7.8	25.899 293	31.53 109	30.857 237	43.64 103	9.046 303	30.72 196	61.50 112	29.17 183
17.8	26.198 299	32.58 105	31.158 301	44.64 100	9.359 313	29.19 153	62.72 129	27.88 129
27.7	26.496 298	33.56 98	31.459 301	45.59 95	9.677 318	28.15 104	64.01 122	27.17 71
	234	88	298	89	317	52	131	9
Sept. 6.7	26.790	34.44	31.757	46.48	9.994	27.63	65.32	27.08
16.7	27.074 284	35.17 73	32.045 288	47.23 75	10.301 307	27.66 3	66.61 129	27.62 54
26.7	27.346 272	35.78 61	32.323 278	47.86 63	10.595 274	28.23 57	67.83 122	28.77 115
Oct. 6.6	27.602 256	36.23 45	32.582 259	48.35 49	10.869 271	29.33 110	68.94 111	30.50 173
16.6	27.839 237	36.52 29	32.826 244	48.71 36	11.117 218	30.91 158	69.92 98	32.76 226
	214	15	213	23	220	201	79	270
26.6	28.053	36.67	33.045	48.94	11.337	32.92	70.71	35.46
Nov. 5.6	28.245 192	36.70 3	33.242 197	49.07 13	11.525 188	35.27 235	71.28 57	38.50 304
15.5	28.408 163	36.63 7	33.409 167	49.09 2	11.673 148	37.89 262	71.63 35	41.77 327
25.5	28.540 132	36.48 15	33.547 138	49.06 3	11.780 107	40.65 276	71.73 10	45.14 337
Dec. 5.5	28.639 99	36.27 21	33.649 102	48.96 10	11.844 64	43.46 281	71.58 15	48.50 336
	60	25	65	13	19	276	41	323
15.4	28.699	36.02	33.714	48.83	11.863	46.22	71.17	51.73
25.4	28.720 21	35.77 25	33.739 25	48.68 15	11.836 27	48.82 260	70.53 64	54.69 296
35.4	28.701 19	35.51 26	33.720 19	48.50 18	11.764 72	51.17 235	69.67 86	57.30 261
Mean Place	24.550	34.24	29.500	47.15	8.657	41.98	68.180	44.14
Sec δ , Tan δ	1.037	+0.276	1.048	+0.313	1.209	-0.680	5.995	-5.911
$D\mu\alpha$, $D\omega\alpha$	+0.068	-0.008	+0.069	-0.009	+0.045	+0.019	-0.082	+0.162
$D\mu\delta$, $D\omega\delta$	+0.18	+0.90	+0.17	+0.90	+0.17	+0.91	+0.16	+0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Tauri. Mag. 3.6		m Persei. Mag. 6.1		α Tauri. (Aldebaran.) Mag. 1.1		α Doradus. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 24 s	° ' +19 0 "	h m 4 27 s	° ' +42 53 "	h m 4 31 s	° ' +16 21 "	h m 4 32 s	° ' -55 11 "
Jan. 0.4	8.299	32.32	61.255	60.25	31.196	12.93	21.544	92.66
10.4	8.263 ³⁶	32.20 ¹²	61.198 ⁵⁷	61.34 ¹⁰³	31.164 ³²	12.67 ²⁶	21.349 ¹⁹⁵	95.30 ²⁶⁴
20.4	8.181 ⁸²	32.05 ¹⁵	61.087 ¹¹¹	62.25 ⁹¹	31.089 ⁷⁵	12.41 ²⁶	21.097 ²⁵²	97.50 ²²⁰
30.3	8.062 ¹¹⁹	31.88 ¹⁷	60.928 ¹⁵⁹	62.93 ⁶⁸	30.978 ¹¹¹	12.16 ²⁵	20.796 ³⁰¹	99.21 ¹⁷¹
Feb. 9.3	7.914 ¹⁴⁸	31.66 ²²	60.728 ²⁰⁰	63.36 ⁴³	30.835 ¹⁴³	11.90 ²⁶	20.457 ³³⁹	100.40 ¹¹⁹
19.3	7.742 ¹⁷²	31.40 ²⁶	60.500 ²²⁸	63.50 ¹⁴	30.668 ¹⁶⁷	11.62 ²⁸	20.089 ³⁶⁸	101.05 ⁶⁵
Mar. 1.2	7.558 ¹⁸⁴	31.12 ²⁸	60.253 ²⁴⁷	63.35 ¹⁵	30.486 ¹⁸²	11.34 ²⁸	19.706 ³⁸³	101.14 ⁹
11.2	7.370 ¹⁸⁸	30.80 ³²	60.002 ²⁵¹	62.93 ⁴²	30.298 ¹⁸⁸	11.06 ²⁸	19.323 ³⁸³	100.69 ⁴⁵
21.2	7.190 ¹⁸⁰	30.46 ³⁴	59.761 ²¹¹	62.23 ⁷⁰	30.118 ¹⁸⁰	10.80 ²⁶	18.950 ³⁷³	99.72 ⁹⁷
31.2	7.027 ¹⁶³	30.14 ³²	59.544 ²¹⁷	61.31 ⁹²	29.954 ¹⁶⁴	10.57 ²³	18.604 ³⁴⁶	98.25 ¹⁴⁷
Apr. 10.1	6.891 ¹³⁶	29.86 ²⁸	59.363 ¹⁸¹	60.22 ¹⁰⁹	29.817 ¹³⁷	10.39 ¹⁸	18.292 ³¹²	96.32 ¹⁹³
20.1	6.793 ⁹⁸	29.64 ²²	59.227 ¹³⁶	58.99 ¹²³	29.714 ¹⁰³	10.28 ¹¹	18.027 ²⁶⁵	93.97 ²³⁵
30.1	6.737 ⁵⁶	29.48 ¹⁶	59.144 ⁸³	57.69 ¹³⁰	29.652 ⁶²	10.29 ¹	17.818 ²⁰⁹	91.27 ²⁷⁰
May 10.1	6.725 ¹²	29.46 ¹²	59.119 ²⁵	56.38 ¹⁴⁶	29.630 ²²	10.39 ¹⁰	17.672 ¹⁴⁶	88.27 ³⁰⁰
20.0	6.760 ³⁵	29.55 ⁹	59.155 ³⁶	55.12 ¹²⁶	29.659 ²⁹	10.63 ²⁴	17.592 ⁸⁰	85.03 ³²⁴
30.0	6.845 ⁸⁵	29.78 ²³	59.253 ⁹⁸	53.97 ¹¹⁵	29.733 ⁷⁴	11.01 ³⁸	17.582 ¹⁰	81.63 ³⁴⁰
June 9.0	6.975 ¹³⁰	30.17 ³⁹	59.407 ¹⁵⁴	52.95 ¹⁰²	29.854 ¹²¹	11.51 ⁵⁰	17.640 ⁵⁸	78.15 ³⁴⁸
18.9	7.146 ¹⁷¹	30.69 ⁵²	59.615 ²⁰⁸	52.10 ⁸⁵	30.015 ¹⁶¹	12.17 ⁶⁶	17.768 ¹²⁸	74.68 ³¹⁷
28.9	7.355 ²⁰⁹	31.35 ⁶⁶	59.870 ²⁵⁵	51.46 ⁶⁴	30.215 ²⁰⁰	12.92 ⁷⁵	17.959 ¹⁹¹	71.31 ³³⁷
July 8.9	7.593 ²³⁸	32.11 ⁷⁶	60.165 ²⁹⁵	51.03 ⁴³	30.443 ²²⁸	13.77 ⁸⁵	18.210 ²⁵¹	68.12 ³¹⁹
18.9	7.858 ²⁶⁵	32.96 ⁸⁵	60.493 ³²⁸	50.83 ²⁰	30.699 ²⁵⁶	14.72 ⁹⁵	18.514 ³⁰⁴	65.21 ²⁹¹
28.8	8.142 ²⁸¹	33.87 ⁹¹	60.846 ³⁵³	50.85 ²	30.975 ²⁷⁶	15.68 ⁹⁶	18.861 ³⁴⁷	62.65 ²⁵⁶
Aug. 7.8	8.439 ²⁹⁷	34.83 ⁹⁶	61.216 ³⁷⁰	51.09 ²¹	31.265 ²⁹⁰	16.67 ⁹⁹	19.243 ³⁸²	60.53 ²¹²
17.8	8.740 ³⁰¹	35.75 ⁹²	61.597 ³⁸¹	51.52 ⁴³	31.560 ²⁹⁵	17.63 ⁹⁶	19.651 ⁴⁰⁸	58.92 ¹⁶¹
27.8	9.044 ³⁰⁴	36.67 ⁹²	61.980 ³⁸³	52.13 ⁶¹	31.859 ²⁹⁹	18.51 ⁸⁸	20.074 ⁴²³	57.87 ¹⁰⁵
Sept. 6.7	9.347 ³⁰³	37.52 ⁸⁵	62.361 ³⁸¹	52.92 ⁷⁹	32.159 ³⁰⁰	19.29 ⁷⁸	20.501 ⁴²⁷	57.44 ⁴³
16.7	9.639 ²⁹²	38.24 ⁷²	62.733 ³⁷²	53.85 ⁹³	32.449 ²⁹⁰	19.96 ⁶⁷	20.920 ⁴¹⁹	57.63 ¹⁹
26.7	9.920 ²⁸¹	38.88 ⁶⁴	63.093 ³⁶⁰	54.90 ¹⁰⁵	32.730 ²⁸¹	20.48 ⁵²	21.322 ⁴⁰²	58.46 ⁸³
Oct. 6.6	10.187 ²⁶⁷	39.41 ⁵³	63.435 ³⁴²	56.07 ¹¹⁷	32.995 ²⁶⁵	20.86 ³⁸	21.698 ³⁷⁶	59.88 ¹⁴²
16.6	10.439 ²⁵²	39.81 ⁴⁰	63.755 ³²⁰	57.33 ¹²⁶	33.248 ²⁵³	21.14 ²⁸	22.038 ³⁴⁰	61.87 ¹⁹⁹
26.6	10.665 ²²⁶	40.09 ²⁸	64.048 ²⁹³	58.66 ¹³³	33.476 ²²⁸	21.26 ¹²	22.331 ²⁹³	64.33 ²⁴⁶
Nov. 5.6	10.869 ²⁰⁴	40.28 ¹⁹	64.311 ²⁶³	60.06 ¹⁴⁰	33.684 ²⁰⁸	21.24 ²	22.571 ²⁴⁰	67.19 ²⁸⁶
15.5	11.044 ¹⁷⁵	40.40 ¹²	64.537 ²²⁶	61.50 ¹⁴⁴	33.861 ¹⁷⁷	21.17 ⁷	22.752 ¹⁸¹	70.33 ³¹⁴
25.5	11.188 ¹⁴⁴	40.43 ³	64.722 ¹⁸⁵	62.97 ¹⁴⁷	34.012 ¹⁵¹	21.01 ¹⁶	22.871 ¹¹⁹	73.66 ³³³
Dec. 5.5	11.299 ¹¹¹	40.42 ¹	64.861 ¹³⁹	64.42 ¹⁴⁵	34.127 ¹¹⁵	20.81 ²⁰	22.919 ⁴⁸	77.04 ³³⁸
15.5	11.368 ⁶⁹	40.38 ⁴	64.948 ⁸⁷	65.84 ¹⁴²	34.203 ⁷⁶	20.59 ²²	22.899 ²⁰	80.34 ³³⁰
25.4	11.399 ³¹	40.32 ⁶	64.981 ³³	67.19 ¹³⁵	34.240 ³⁷	20.36 ²³	22.813 ⁸⁶	83.45 ³¹¹
35.4	11.385 ¹⁴	40.24 ⁸	64.960 ²¹	68.40 ¹²¹	34.232 ⁸	20.13 ²³	22.656 ¹⁵⁷	86.26 ²⁸¹
Mean Place	7.094	39.17	59.554	63.12	30.001	20.55	19.880	74.01
Sec δ, Tan δ	1.058	+0.344	1.365	+0.929	1.042	+0.293	1.752	-1.439
Dψα, Dωα	+0.070	-0.009	+0.084	-0.024	+0.068	-0.007	+0.026	+0.036
Dψδ, Dωδ	+0.16	+0.91	+0.16	+0.92	+0.15	+0.93	+0.15	+0.93

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Eridani. Mag. 4.1		δ Eridani. Mag. 4.0		τ Tauri. Mag. 4.3		α Coeli. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 32	° ' - 3 30	h m 4 34	° ' -14 27	h m 4 37	° ' +22 48	h m 4 38	° ' -42 0
	s	"	s	"	s	"	s	"
Jan. 0.4	29.285	42.82	40.199	25.72	38.573	30.93	6.044	54.88
10.4	29.244	44.02	40.150	27.39	38.544	31.02	5.931	57.39
20.4	29.166	45.09	40.061	28.87	38.469	31.05	5.770	59.53
30.3	29.052	45.99	39.937	30.06	38.357	31.03	5.567	61.24
Feb. 9.3	28.908	46.70	39.783	30.99	38.212	30.95	5.331	62.49
19.3	28.744	47.20	39.605	31.61	38.038	30.82	5.068	63.25
Mar. 1.3	28.563	47.51	39.413	31.93	37.847	30.60	4.791	63.51
11.2	28.379	47.61	39.219	31.93	37.652	30.33	4.510	63.27
21.2	28.200	47.50	39.029	31.64	37.461	30.00	4.236	62.55
31.2	28.036	47.18	38.855	31.03	37.289	29.61	3.979	61.37
Apr. 10.1	27.897	46.64	38.703	30.14	37.143	29.21	3.752	59.74
20.1	27.790	45.89	38.586	28.97	37.029	28.87	3.560	57.73
30.1	27.721	44.93	38.503	27.53	36.961	28.54	3.414	55.36
May 10.1	27.693	43.77	38.464	25.85	36.938	28.29	3.319	52.67
20.0	27.710	42.42	38.469	23.95	36.961	28.15	3.277	49.74
30.0	27.771	40.92	38.521	21.91	37.031	28.15	3.290	46.64
June 9.0	27.877	39.28	38.617	19.72	37.152	28.27	3.358	43.44
19.0	28.022	37.53	38.752	17.45	37.315	28.51	3.479	40.21
28.9	28.203	35.75	38.927	15.17	37.518	28.91	3.650	37.02
July 8.9	28.415	33.95	39.133	12.93	37.751	29.43	3.866	33.98
18.9	28.652	32.19	39.367	10.80	38.014	30.04	4.120	31.17
28.8	28.909	30.54	39.623	8.83	38.300	30.74	4.407	28.66
Aug. 7.8	29.182	29.04	39.894	7.11	38.596	31.49	4.720	26.55
17.8	29.462	27.74	40.175	5.66	38.904	32.29	5.050	24.89
27.8	29.745	26.71	40.460	4.57	39.214	33.05	5.391	23.74
Sept. 6.7	30.025	25.95	40.745	3.86	39.523	33.80	5.734	23.15
16.7	30.300	25.50	41.023	3.54	39.828	34.47	6.072	23.15
26.7	30.564	25.39	41.291	3.65	40.122	35.11	6.399	23.73
Oct. 6.7	30.816	25.58	41.546	4.18	40.402	35.65	6.705	24.89
16.6	31.052	26.10	41.782	5.09	40.668	36.11	6.987	26.58
26.6	31.266	26.88	41.997	6.35	40.915	36.49	7.237	28.74
Nov. 5.6	31.457	27.91	42.188	7.89	41.136	36.84	7.449	31.29
15.5	31.621	29.12	42.350	9.67	41.329	37.11	7.621	34.14
25.5	31.756	30.45	42.480	11.59	41.490	37.34	7.746	37.19
Dec. 5.5	31.855	31.84	42.575	13.59	41.619	37.53	7.821	40.29
15.5	31.921	33.24	42.631	15.58	41.704	37.70	7.845	43.35
25.4	31.947	34.59	42.649	17.48	41.749	37.86	7.816	46.27
35.4	31.932	35.85	42.626	19.25	41.748	38.00	7.736	48.93
Mean Place	28.208	31.52	39.121	12.51	37.287	37.62	4.706	37.80
Sec δ , Tan δ	1.002	-0.061	1.033	-0.258	1.085	+0.420	1.346	-0.901
$D\psi\alpha$, $D\omega\alpha$	+0.060	+0.002	+0.055	+0.006	+0.072	-0.010	+0.039	+0.021
$D\psi\delta$, $D\omega\delta$	+0.15	+0.93	+0.14	+0.93	+0.14	+0.94	+0.14	+0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 848. Mag. 6.0		4 Camelop. Mag. 5.4		μ Eridani. Mag. 4.2		π^3 Orionis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 38	° ' +75 47	h m 4 41	° ' +56 37	h m 4 41	° ' - 3 23	h m 4 45	° ' + 6 49
	s	"	s	"	s	"	s	"
Jan. 0.4	32.06	73.39	37.314	17.91	40.192	52.12	40.669	31.61
10.4	31.77 ²⁹	75.99 ²⁶⁰	37.235 ⁷⁹	19.73 ¹⁸²	40.159 ³³	53.34 ¹²²	40.647 ²²	30.86 ⁷⁵
20.4	31.32 ⁴⁵	78.26 ²²⁷	37.084 ¹⁵¹	21.31 ¹⁵⁸	40.087 ⁷²	54.43 ¹⁰⁹	40.583 ⁶⁴	30.20 ⁶⁶
30.3	30.74 ⁵⁸	80.10 ¹⁸⁴	36.867 ²¹⁷	22.57 ¹²⁶	39.978 ¹⁰⁹	55.35 ⁹²	40.481 ¹⁰²	29.62 ⁵⁸
Feb. 9.3	30.04 ⁷⁰	81.47 ¹³⁷	36.596 ²⁷¹	23.49 ⁹²	39.839 ¹³⁹	56.07 ⁷²	40.348 ¹³³	29.14 ⁴⁸
	78	84	316	51	165	53	159	39
19.3	29.26	82.31	36.280	24.00	39.674	56.60	40.189	28.75
Mar. 1.3	28.44 ⁸²	82.58 ²⁷	35.941 ³³⁹	24.12 ¹²	39.495 ¹⁷⁹	56.92 ³²	40.014 ¹⁷⁵	28.46 ²⁹
11.2	27.61 ⁸³	82.30 ²⁸	35.593 ³⁴⁸	23.82 ³⁰	39.310 ¹⁸⁵	57.05 ¹³	39.831 ¹⁸³	28.28 ¹⁸
21.2	26.80 ⁸¹	81.47 ⁸³	35.255 ³³⁸	23.13 ⁶⁹	39.128 ¹⁸²	56.97 ⁸	39.652 ¹⁷⁹	28.21 ⁷
31.2	26.06 ⁷⁴	80.13 ¹³⁴	34.945 ³¹⁰	22.07 ¹⁰⁶	38.961 ¹⁶⁷	56.67 ³⁰	39.486 ¹⁶⁶	28.25 ⁴
	64	178	266	138	145	51	144	16
Apr. 10.1	25.42	78.35	34.679	20.69	38.816	56.16	39.342	28.41
20.1	24.90 ⁵²	76.23 ²¹²	34.469 ²¹⁰	19.08 ¹⁶¹	38.703 ¹¹³	55.43 ⁷³	39.231 ¹¹¹	28.72 ³¹
30.1	24.53 ³⁷	73.81 ²⁴²	34.326 ¹⁴³	17.28 ¹⁸⁰	38.626 ⁷⁷	54.51 ⁹²	39.158 ⁷³	29.17 ⁴⁵
May 10.1	24.32 ²¹	71.22 ²⁴²	34.259 ⁶⁷	15.37 ¹⁹¹	38.591 ³⁵	53.37 ¹¹⁴	39.126 ³²	29.77 ⁶⁰
20.0	24.27 ⁵	68.53 ²⁶⁹	34.270 ¹¹	13.44 ¹⁹³	38.600 ⁹	52.06 ¹³¹	39.139 ¹³	30.53 ⁷⁶
	12	268	87	189	52	147	57	90
30.0	24.39	65.85	34.357	11.55	38.652	50.59	39.196	31.43
June 9.0	24.67 ²⁸	63.24 ²⁶¹	34.521 ¹⁶⁴	9.77 ¹⁷⁸	38.749 ⁹⁷	48.97 ¹⁶²	39.296 ¹⁰⁰	32.46 ¹⁰³
19.0	25.11 ⁴⁴	60.81 ²¹³	34.755 ²³⁴	8.14 ¹⁶³	38.886 ¹³⁷	47.26 ¹⁷¹	39.437 ¹⁴¹	33.61 ¹¹⁵
28.9	25.69 ⁵⁸	58.60 ²²¹	35.054 ²⁹⁹	6.71 ¹⁴³	39.060 ¹⁷⁴	45.49 ¹⁷⁷	39.616 ¹⁷⁹	34.85 ¹²⁴
July 8.9	26.40 ⁷¹	56.70 ¹⁹⁰	35.409 ³⁵⁵	5.52 ¹¹⁹	39.266 ²⁰⁶	43.71 ¹⁷⁸	39.827 ²¹¹	36.13 ¹²⁸
	81	159	403	92	231	173	236	130
18.9	27.21	55.11	35.812	4.60	39.497	41.98	40.063	37.43
28.8	28.11 ⁹⁰	53.91 ¹²⁰	36.250 ⁴³⁸	3.98 ⁶²	39.750 ²⁵³	40.35 ¹⁶³	40.321 ²⁵⁸	38.70 ¹²⁷
Aug. 7.8	29.08 ⁹⁷	53.10 ⁸¹	36.718 ⁴⁶⁸	3.64 ³⁴	40.018 ²⁶⁸	38.86 ¹⁴⁹	40.593 ²⁷²	39.89 ¹¹⁹
17.8	30.10 ¹⁰²	52.73 ³⁷	37.203 ⁴⁸⁵	3.61 ³	40.295 ²⁷⁷	37.58 ¹²⁸	40.875 ²⁸²	40.98 ¹⁰⁹
27.8	31.15 ¹⁰⁵	52.72 ¹	37.698 ⁴⁹⁵	3.87 ²⁶	40.576 ²⁸¹	36.54 ¹⁰⁴	41.162 ²⁸⁷	41.91 ⁹³
	105	43	497	52	281	75	286	74
Sept. 6.7	32.20	53.15	38.195	4.39	40.857	35.79	41.448	42.65
16.7	33.25 ¹⁰⁵	54.00 ⁸⁵	38.686 ⁴⁹¹	5.20 ⁸¹	41.134 ²⁷⁷	35.34 ⁴⁵	41.731 ²⁸³	43.18 ⁵³
26.7	34.27 ¹⁰²	55.24 ¹²⁴	39.165 ⁴⁷⁹	6.27 ¹⁰⁷	41.402 ²⁶⁸	35.22 ¹²	42.005 ²⁷⁴	43.47 ²⁹
Oct. 6.7	35.24 ⁹⁷	56.86 ¹⁶²	39.622 ⁴⁵⁷	7.56 ¹²⁹	41.657 ²⁵⁵	35.44 ²²	42.268 ²⁶³	43.54 ⁷
16.6	36.14 ⁹⁰	58.82 ¹⁹⁶	40.054 ⁴³²	9.08 ¹⁵²	41.897 ²⁴⁰	35.95 ⁵¹	42.517 ²⁴⁹	43.38 ¹⁶
	82	230	398	172	220	79	231	36
26.6	36.96	61.12	40.452	10.80	42.117	36.74	42.748	43.02
Nov. 5.6	37.69 ⁷³	63.68 ²⁵⁶	40.807 ³⁵⁵	12.68 ¹⁸⁸	42.316 ¹⁹⁹	37.77 ¹⁰³	42.956 ²⁰⁸	42.49 ⁵³
15.5	38.29 ⁶⁰	66.47 ²⁷⁹	41.115 ³⁰⁸	14.70 ²⁰²	42.489 ¹⁷³	39.00 ¹²³	43.140 ¹⁸⁴	41.82 ⁶⁷
25.5	38.75 ⁴⁶	69.42 ²⁹⁵	41.367 ²⁵²	16.83 ²¹³	42.633 ¹⁴⁴	40.34 ¹³⁴	43.296 ¹⁵⁶	41.04 ⁷⁸
Dec. 5.5	39.07 ³²	72.46 ³⁰⁴	41.555 ¹⁸⁸	19.00 ²¹⁷	42.743 ¹¹⁰	41.75 ¹⁴¹	43.418 ¹²²	40.22 ⁸²
	15	305	120	216	73	142	86	83
15.5	39.22	75.51	41.675	21.16	42.816	43.17	43.504	39.39
25.4	39.20 ²	78.47 ²⁹⁶	41.720 ⁴⁵	23.27 ²¹¹	42.850 ³⁴	44.55 ¹³⁸	43.551 ⁴⁷	38.58 ⁸¹
35.4	39.02 ¹⁸	81.25 ²⁷⁸	41.690 ³⁰	25.22 ¹⁹⁵	42.844 ⁶	45.83 ¹²⁸	43.555 ⁴	37.82 ⁷⁶
Mean Place	26.534	73.40	34.941	19.92	39.086	40.76	39.515	41.30
Sec δ , Tan δ	4.077	+3.952	1.818	+1.518	1.002	-0.059	1.007	+0.120
$D\psi\alpha$, $D\omega\alpha$	+0.159	-0.092	+0.099	-0.034	+0.060	+0.001	+0.064	-0.003
$D\psi\delta$, $D\omega\delta$	+0.14	+0.94	+0.13	+0.94	+0.13	+0.94	+0.13	+0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	9 Camelop. Mag. 4.4		ι Tauri. Mag. 5.1		π ⁵ Orionis. Mag. 3.9		ι Aurigæ. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 46	° ' " +66 12	h m 4 46	° ' " +18 42	h m 4 50	° ' " + 2 18	h m 4 51	° ' " +33 2
	s	"	s	"	s	"	s	"
Jan. 0.4	26.45	49.00	53.315	28.46	15.519	46.46	60.063	38.25
10.4	26.32	51.27	53.294	28.33	15.497	45.47	60.043	38.92
20.4	26.10	53.28	53.230	28.19	15.433	44.59	59.970	39.46
30.3	25.79	54.92	53.126	28.06	15.333	43.86	59.854	39.90
Feb. 9.3	25.40	56.13	52.985	27.90	15.199	43.26	59.699	40.23
19.3	24.96	56.90	52.822	27.73	15.039	42.80	59.509	40.35
Mar. 1.3	24.48	57.17	52.639	27.51	14.862	42.47	59.300	40.32
11.2	23.99	56.95	52.447	27.28	14.678	42.31	59.084	40.09
21.2	23.51	56.28	52.259	27.04	14.497	42.30	58.871	39.69
31.2	23.07	55.14	52.087	26.79	14.329	42.46	58.674	39.17
Apr. 10.2	22.69	53.62	51.939	26.56	14.182	42.76	58.500	38.52
20.1	22.38	51.76	51.822	26.39	14.065	43.25	58.367	37.79
30.1	22.16	49.68	51.749	26.28	13.987	43.91	58.276	37.02
May 10.1	22.03	47.42	51.714	26.27	13.947	44.73	58.234	36.26
20.0	22.01	45.09	51.729	26.36	13.951	45.72	58.244	35.55
30.0	22.10	42.77	51.791	26.58	14.002	46.87	58.307	34.92
June 9.0	22.29	40.55	51.900	26.89	14.094	48.14	58.423	34.39
19.0	22.57	38.44	52.049	27.36	14.227	49.52	58.585	34.00
28.9	22.94	36.57	52.237	27.94	14.398	50.98	58.792	33.75
July 8.9	23.39	34.94	52.459	28.59	14.600	52.47	59.032	33.65
18.9	23.90	33.60	52.706	29.36	14.829	53.95	59.309	33.70
28.9	24.47	32.57	52.978	30.18	15.078	55.38	59.609	33.89
Aug. 7.8	25.08	31.90	53.264	31.00	15.345	56.69	59.927	34.21
17.8	25.72	31.57	53.562	31.81	15.622	57.85	60.259	34.62
27.8	26.37	31.63	53.863	32.57	15.905	58.83	60.595	35.13
Sept. 6.7	27.04	32.02	54.164	33.28	16.188	59.56	60.934	35.73
16.7	27.70	32.74	54.462	33.87	16.466	60.04	61.270	36.35
26.7	28.34	33.85	54.753	34.38	16.739	60.26	61.597	37.02
Oct. 6.7	28.95	35.25	55.031	34.75	17.001	60.19	61.915	37.72
16.6	29.53	36.93	55.293	35.02	17.249	59.86	62.214	38.42
26.6	30.07	38.89	55.541	35.17	17.479	59.29	62.496	39.16
Nov. 5.6	30.55	41.12	55.762	35.23	17.687	58.53	62.753	39.90
15.5	30.95	43.53	55.961	35.23	17.872	57.60	62.979	40.68
25.5	31.28	46.06	56.128	35.16	18.027	56.56	63.174	41.46
Dec. 5.5	31.53	48.67	56.261	35.09	18.148	55.45	63.328	42.25
15.5	31.67	51.30	56.356	34.98	18.235	54.33	63.437	43.03
25.4	31.72	53.90	56.408	34.88	18.281	53.26	63.499	43.79
35.4	31.66	56.31	56.417	34.76	18.286	52.24	63.511	44.52
Mean Place	23.146	50.42	52.059	36.22	14.374	56.96	58.583	44.04
Sec δ, Tan δ	2.479	+2.268	1.056	+0.339	1.001	+0.040	1.193	+0.650
Dψα, Dωα	+0.118	-0.048	+0.070	-0.007	+0.062	-0.001	+0.078	-0.013
Dψδ, Dωδ	+0.13	+0.95	+0.12	+0.95	+0.12	+0.95	+0.12	+0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Aurigæ. Var. 3.0-4.5		β Camelop. Mag. 4.2		ζ Aurigæ. Mag. 3.9		ι Tauri. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 4 56	° ' +43 42	h m 4 56	° ' +40 19	h m 4 57	° ' +40 57	h m 4 58	° ' +21 28
	s	"	s	"	s	"	s	"
Jan. 0.4	28.198	34.44	36.31	51.21	7.223	48.98	30.824	44.34
10.4	28.172 ²⁶	35.67 ¹²³	36.24 ⁷	53.28 ²⁰⁷	7.203 ²⁰	50.08 ¹¹⁰	30.814 ¹⁰	44.36 ²
20.4	28.088 ⁸⁴	36.77 ¹¹⁰	36.09 ¹⁵	55.12 ¹⁸⁴	7.126 ⁷⁷	51.04 ⁹⁶	30.759 ⁵⁵	44.39 ³
30.3	27.950 ¹³⁸	37.67 ⁹⁰	35.86 ²³	56.65 ¹⁵³	6.996 ¹³⁰	51.83 ⁷⁹	30.661 ⁹⁸	44.38 ¹
Feb. 9.3	27.765 ¹⁸⁵	38.34 ⁶⁷	35.56 ³⁰	57.82 ¹¹⁷	6.822 ¹⁷⁴	52.42 ⁵⁹	30.525 ¹³⁶	44.35 ³
	221	41	34	76	210	34	164	9
19.3	27.544	38.75	35.22	58.58	6.612	52.76	30.361	44.26
Mar. 1.3	27.297 ²⁴⁷	38.87 ¹²	34.84 ³⁸	58.93 ³⁵	6.378 ²³⁴	52.86 ¹⁰	30.175 ¹⁸⁶	44.14 ¹²
11.2	27.040 ²⁵⁷	38.70 ¹⁷	34.45 ³⁹	58.81 ¹²	6.132 ²⁴⁶	52.69 ¹⁷	29.980 ¹⁹⁵	43.94 ²⁰
21.2	26.787 ²⁵³	38.25 ⁴⁵	34.06 ³⁹	58.26 ⁵⁵	5.891 ²⁴¹	52.28 ⁴¹	29.786 ¹⁹⁴	43.71 ²³
31.2	26.551 ²³⁶	37.54 ⁷¹	33.70 ³⁶	57.32 ⁹⁴	5.666 ²²⁵	51.63 ⁶⁵	29.607 ¹⁷⁹	43.44 ²⁷
	205	90	31	131	197	84	159	27
Apr. 10.2	26.346	36.64	33.39	56.01	5.469	50.79	29.448	43.17
20.1	26.180 ¹⁶⁶	35.55 ¹⁰⁹	33.13 ²⁶	54.41 ¹⁶⁰	5.313 ¹⁵⁶	49.80 ⁹⁹	29.324 ¹²⁴	42.90 ²⁷
30.1	26.067 ¹¹³	34.34 ¹²¹	32.94 ¹⁹	52.57 ¹⁸¹	5.204 ¹⁰⁹	48.71 ¹⁰⁹	29.237 ⁸⁷	42.68 ²²
May 10.1	26.008 ⁵⁹	33.07 ¹²⁷	32.84 ¹⁰	50.58 ¹⁹⁹	5.149 ⁵⁵	47.57 ¹¹⁴	29.195 ⁴²	42.53 ¹⁵
20.0	26.009 ¹	31.79 ¹²⁸	32.82 ²	48.52 ²⁰⁶	5.152 ³	46.43 ¹¹⁴	29.198 ³	42.45 ⁸
	62	124	6	207	60	108	53	2
30.0	26.071	30.55	32.88	46.45	5.212	45.35	29.251	42.47
June 9.0	26.191 ¹²⁰	29.42 ¹¹³	33.03 ¹⁵	44.44 ²⁰¹	5.329 ¹¹⁷	44.35 ¹⁰⁰	29.350 ⁹⁹	42.61 ¹⁴
19.0	26.369 ¹⁷⁸	28.38 ¹⁰⁴	33.25 ²²	42.58 ¹⁸⁶	5.500 ¹⁷¹	43.48 ⁸⁷	29.492 ¹⁴²	42.87 ²⁶
28.9	26.595 ²²⁶	27.52 ⁸⁶	33.55 ³⁰	40.89 ¹⁶⁹	5.718 ²¹⁸	42.77 ⁷¹	29.674 ¹⁸²	43.24 ³⁷
July 8.9	26.866 ²⁷¹	26.85 ⁶⁷	33.92 ³⁷	39.41 ¹¹⁸	5.979 ²⁶¹	42.23 ⁵⁴	29.891 ²¹⁷	43.72 ⁴⁸
	308	49	42	121	297	36	244	55
18.9	27.174	26.36	34.34	38.20	6.276	41.87	30.135	44.27
28.9	27.512 ³³⁸	26.07 ²⁹	34.80 ⁴⁶	37.27 ⁹³	6.600 ³²⁴	41.69 ¹⁸	30.405 ²⁷⁰	44.90 ⁶³
Aug. 7.8	27.872 ³⁶⁰	25.98 ⁹	35.30 ⁵⁰	36.65 ⁶²	6.947 ³¹⁷	41.68 ¹	30.692 ²⁸⁷	45.57 ⁶⁷
17.8	28.248 ³⁷⁶	26.08 ¹⁰	35.83 ⁵³	36.33 ³²	7.308 ³⁶¹	41.86 ¹⁸	30.991 ²⁹⁹	46.24 ⁶⁷
27.8	28.633 ³⁸⁵	26.37 ²⁹	36.37 ⁵¹	36.33 ⁰	7.677 ³⁶⁹	42.18 ³²	31.295 ³⁰⁴	46.90 ⁶⁶
	387	45	55	30	372	47	305	60
Sept. 6.7	29.020	26.82	36.92	36.63	8.049	42.65	31.600	47.50
16.7	29.405 ³⁸⁵	27.42 ⁶⁰	37.46 ⁵⁴	37.23 ⁶⁰	8.419 ³⁷⁰	43.25 ⁶⁰	31.905 ³⁰⁵	48.05 ⁵⁵
26.7	29.783 ³⁷⁸	28.19 ⁷⁷	38.00 ⁵⁴	38.12 ⁸⁹	8.782 ³⁶³	43.97 ⁷²	32.203 ²³⁸	48.51 ⁴⁶
Oct. 6.7	30.148 ³⁶⁵	29.06 ⁸⁷	38.52 ⁵²	39.29 ¹¹⁷	9.133 ³⁵¹	44.79 ⁸²	32.491 ²⁸⁸	48.89 ³⁸
16.6	30.496 ³⁴⁸	30.07 ¹⁰¹	39.01 ⁴⁹	40.72 ¹⁴³	9.467 ³³⁴	45.70 ⁹¹	32.766 ²⁷⁵	49.17 ²⁸
	324	111	46	168	313	99	259	20
26.6	30.820	31.18	39.47	42.40	9.780	46.69	33.025	49.37
Nov. 5.6	31.119 ²⁹⁹	32.40 ¹²²	39.88 ⁴¹	44.28 ¹⁸⁸	10.067 ²⁸⁷	47.77 ¹⁰⁸	33.262 ²³⁷	49.52 ¹⁵
15.6	31.383 ²⁶⁴	33.68 ¹²⁸	40.24 ³⁶	46.35 ²⁰⁷	10.322 ²⁵⁵	48.93 ¹¹⁶	33.474 ²¹²	49.61 ⁹
25.5	31.606 ²²³	35.05 ¹³⁷	40.55 ³¹	48.55 ²²⁰	10.540 ²¹⁸	50.13 ¹²⁰	33.656 ¹⁸²	49.66 ⁵
Dec. 5.5	31.785 ¹⁷⁹	36.44 ¹³⁹	40.78 ²³	50.86 ²³¹	10.714 ¹⁷⁴	51.37 ¹²⁴	33.804 ¹⁴⁸	49.71 ⁵
	127	143	16	233	125	126	109	4
15.5	31.912	37.87	40.94	53.19	10.839	52.63	33.913	49.75
25.4	31.983 ⁷¹	39.26 ¹³⁹	41.01 ⁷	55.49 ²³⁰	10.910 ⁷¹	53.86 ¹²³	33.978 ⁶⁵	49.79 ⁴
35.4	31.995 ¹²	40.59 ¹³³	40.99 ²	57.68 ²¹⁹	10.926 ¹⁶	55.02 ¹¹⁶	33.998 ²⁰	49.84 ⁵
Mean Place	26.433	39.07	33.642	54.02	5.544	54.01	29.517	52.12
Sec δ, Tan δ	1.383	+0.956	2.020	+1.755	1.324	+0.868	1.075	+0.393
Dψα, Dωα	+0.086	-0.017	+0.106	-0.032	+0.083	-0.016	+0.071	-0.007
Dψδ, Dωδ	+0.11	+0.96	+0.11	+0.96	+0.11	+0.96	+0.11	+0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	11 Orionis. Mag. 4.6		η Aurigæ. Mag. 3.3		ϵ Leporis. Mag. 3.3		β Eridani. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 0 s	° ' " +15 17 "	h m 5 1 s	° ' " +41 7 "	h m 5 2 s	° ' " -22 28 "	h m 5 4 s	° ' " - 5 11 "
Jan. 0.4	11.309	44.48	8.444	49.32	13.259	38.51	5.008	17.06
10.4	11.301	44.16	8.426	50.42	13.220	40.64	4.990	18.45
20.4	11.248	43.87	8.351	51.41	13.139	42.52	4.934	19.67
30.4	11.155	43.62	8.227	52.23	13.014	44.08	4.835	20.71
Feb. 9.3	11.025	43.41	8.054	52.85	12.857	45.31	4.703	21.55
19.3	10.866	43.20	7.846	53.24	12.672	46.18	4.543	22.18
Mar. 1.3	10.688	43.00	7.611	53.36	12.468	46.66	4.367	22.57
11.2	10.499	42.82	7.367	53.23	12.255	46.79	4.178	22.73
21.2	10.312	42.66	7.123	52.84	12.044	46.54	3.992	22.69
31.2	10.136	42.53	6.896	52.22	11.844	45.92	3.815	22.40
Apr. 10.2	9.983	42.45	6.696	51.41	11.665	44.95	3.657	21.88
20.1	9.860	42.42	6.536	50.43	11.514	43.65	3.529	21.14
30.1	9.775	42.47	6.422	49.36	11.398	42.03	3.435	20.18
May 10.1	9.732	42.62	6.364	48.23	11.325	40.13	3.377	19.02
20.1	9.734	42.90	6.360	47.09	11.295	38.00	3.366	17.69
30.0	9.782	43.28	6.416	45.99	11.312	35.67	3.399	16.19
June 9.0	9.873	43.78	6.529	44.98	11.373	33.19	3.472	14.54
19.0	10.008	44.39	6.696	44.06	11.479	30.64	3.588	12.78
28.9	10.182	45.11	6.910	43.32	11.626	28.05	3.738	11.00
July 8.9	10.389	45.91	7.166	42.74	11.808	25.53	3.924	9.19
18.9	10.624	46.76	7.460	42.35	12.023	23.12	4.140	7.42
28.9	10.882	47.64	7.784	42.12	12.263	20.91	4.376	5.75
Aug. 7.8	11.157	48.51	8.130	42.07	12.525	18.95	4.632	4.24
17.8	11.443	49.33	8.490	42.19	12.802	17.32	4.902	2.93
27.8	11.735	50.07	8.859	42.46	13.090	16.09	5.180	1.87
Sept. 6.8	12.030	50.72	9.233	42.89	13.381	15.29	5.460	1.13
16.7	12.324	51.24	9.606	43.44	13.672	14.95	5.739	0.70
26.7	12.611	51.61	9.971	44.11	13.956	15.10	6.012	0.62
Oct. 6.7	12.889	51.82	10.324	44.90	14.230	15.73	6.277	0.88
16.6	13.155	51.89	10.662	45.77	14.491	16.81	6.529	1.47
26.6	13.404	51.84	10.980	46.74	14.731	18.30	6.764	2.36
Nov. 5.6	13.633	51.67	11.272	47.80	14.946	20.16	6.981	3.51
15.6	13.838	51.40	11.532	48.92	15.135	22.29	7.173	4.86
25.5	14.014	51.08	11.754	50.11	15.289	24.63	7.336	6.34
Dec. 5.5	14.158	50.74	11.934	51.34	15.406	27.07	7.465	7.94
15.5	14.263	50.38	12.064	52.60	15.484	29.52	7.559	9.52
25.5	14.327	50.04	12.140	53.83	15.518	31.90	7.610	11.06
35.4	14.347	49.74	12.161	55.02	15.507	34.13	7.622	12.52
Mean Place	10.065	53.22	6.755	54.56	12.043	24.54	3.844	5.33
Sec δ , Tan δ	1.037	+0.274	1.328	+0.873	1.082	-0.414	1.004	-0.091
$D\psi\alpha$, $D\omega\alpha$	+0.068	-0.005	+0.084	-0.015	+0.051	+0.007	+0.059	+0.001
$D\psi\delta$, $D\omega\delta$	+0.10	+0.97	+0.10	+0.97	+0.10	+0.97	+0.10	+0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aurigæ. Mag. 4.8		μ Leporis. Mag. 3.3		19 H. Camelop. Mag. 5.2		β Orionis. (Rigel.) Mag. 0.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 8 s	° ' " +38 23 "	h m 5 9 s	° ' " -16 17 "	h m 5 9 s	° ' " +79 8 "	h m 5 10 s	° ' " - 8 17 "
Jan. 0.4	10.973	35.09	29.530	57.35	57.46	43.93	51.371	34.28
10.4	10.966	36.06	29.508	59.27	57.20	46.81	51.356	35.85
20.4	10.904	36.95	29.440	60.96	56.73	49.43	51.301	37.23
30.4	10.791	37.69	29.333	62.40	56.06	51.68	51.204	38.40
Feb. 9.3	10.632	38.26	29.192	63.53	55.22	53.49	51.072	39.34
19.3	10.435	38.64	29.021	64.36	54.24	54.79	50.915	40.03
Mar. 1.3	10.214	38.79	28.830	64.88	53.18	55.55	50.735	40.47
11.2	9.980	38.70	28.630	65.05	52.09	55.71	50.544	40.66
21.2	9.746	38.39	28.429	64.90	50.99	55.31	50.353	40.58
31.2	9.524	37.87	28.237	64.44	49.96	54.36	50.172	40.28
Apr. 10.2	9.329	37.17	28.066	63.66	49.02	52.91	50.008	39.70
20.1	9.171	36.35	27.921	62.58	48.23	51.03	49.873	38.88
30.1	9.057	35.41	27.811	61.23	47.60	48.78	49.773	37.81
May 10.1	8.993	34.43	27.741	59.61	47.16	46.26	49.708	36.56
20.1	8.984	33.44	27.713	57.77	46.93	43.57	49.687	35.08
30.0	9.031	32.50	27.729	55.74	46.91	40.79	49.709	33.43
June 9.0	9.134	31.61	27.790	53.56	47.11	38.02	49.775	31.63
19.0	9.287	30.85	27.893	51.28	47.51	35.33	49.883	29.74
28.9	9.486	30.21	28.034	48.97	48.10	32.81	50.026	27.81
July 8.9	9.729	29.74	28.212	46.67	48.88	30.51	50.207	25.87
18.9	10.006	29.41	28.421	44.47	49.80	28.50	50.415	23.98
28.9	10.312	29.23	28.654	42.43	50.87	26.82	50.645	22.21
Aug. 7.8	10.642	29.23	28.909	40.60	52.04	25.52	50.897	20.59
17.8	10.988	29.36	29.177	39.07	53.31	24.59	51.165	19.23
27.8	11.342	29.61	29.456	37.87	54.63	24.09	51.441	18.14
Sept. 6.8	11.702	29.98	29.739	37.06	56.00	24.01	51.721	17.37
16.7	12.060	30.46	30.023	36.67	57.37	24.36	52.000	16.94
26.7	12.414	31.02	30.303	36.72	58.73	25.13	52.276	16.89
Oct. 6.7	12.759	31.68	30.574	37.20	60.05	26.33	52.543	17.21
16.6	13.088	32.40	30.831	38.10	61.31	27.90	52.799	17.90
26.6	13.401	33.21	31.072	39.38	62.47	29.86	53.039	18.89
Nov. 5.6	13.690	34.08	31.292	41.00	63.52	32.18	53.262	20.18
15.6	13.949	35.01	31.486	42.87	64.43	34.78	53.458	21.68
25.5	14.172	35.99	31.649	44.93	65.17	37.63	53.626	23.35
Dec. 5.5	14.354	37.03	31.777	47.09	65.72	40.65	53.759	25.11
15.5	14.492	38.10	31.867	49.28	66.06	43.76	53.858	26.88
25.5	14.576	39.17	31.916	51.40	66.17	46.87	53.913	28.61
35.4	14.605	40.21	31.922	53.38	66.06	49.88	53.930	30.25
Mean Place	9.355	41.11	28.326	44.26	50.252	46.52	50.186	22.17
Sec δ , Tan δ	1.276	+0.792	1.042	-0.292	5.310	+5.215	1.011	-0.146
$D\psi\alpha$, $D\omega\alpha$	+0.082	-0.012	+0.054	+0.004	+0.196	-0.076	+0.057	+0.002
$D\psi\delta$, $D\omega\delta$	+0.09	+0.97	+0.09	+0.98	+0.09	+0.98	+0.08	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Aurigæ. (Capella.) Mag. 0.2		λ Aurigæ. Mag. 4.8		τ Orionis. Mag. 3.7		σ Columbæ. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 10 s	° ' " +45 55 "	h m 5 13 s	° ' " +40 1 "	h m 5 13 s	° ' " - 6 55 "	h m 5 14 s	° ' " -34 58 "
Jan. 0.4	61.732	11.42	44.993	49.74	53.217	47.30	43.657	26.67
10.4	61.722	12.78	44.994	50.79	53.208	48.81	43.603	29.29
20.4	61.647	14.02	44.937	51.76	53.156	50.15	43.500	31.62
30.4	61.516	15.09	44.826	52.59	53.064	51.28	43.352	33.58
Feb. 9.3	61.333	15.92	44.667	53.23	52.935	52.20	43.166	35.13
19.3	61.110	16.48	44.471	53.68	52.778	52.87	42.948	36.25
Mar. 1.3	60.859	16.78	44.246	53.88	52.600	53.32	42.709	36.92
11.3	60.593	16.73	44.007	53.84	52.410	53.51	42.457	37.14
21.2	60.325	16.42	43.767	53.55	52.220	53.47	42.204	36.88
31.2	60.074	15.79	43.539	53.04	52.038	53.17	41.963	36.19
Apr. 10.2	59.849	14.91	43.337	52.31	51.875	52.65	41.742	35.06
20.1	59.663	13.84	43.171	51.44	51.738	51.88	41.549	33.54
30.1	59.529	12.63	43.050	50.45	51.636	50.90	41.395	31.65
May 10.1	59.450	11.30	42.981	49.39	51.572	49.69	41.283	29.42
20.1	59.432	9.92	42.966	48.31	51.550	48.30	41.218	26.91
30.0	59.474	8.56	43.008	47.25	51.571	46.72	41.203	24.19
June 9.0	59.579	7.26	43.107	46.26	51.636	45.02	41.237	21.30
19.0	59.742	6.04	43.258	45.37	51.741	43.21	41.320	18.33
29.0	59.958	4.98	43.457	44.61	51.884	41.34	41.449	15.33
July 8.9	60.221	4.07	43.699	43.99	52.061	39.46	41.620	12.40
18.9	60.523	3.36	43.978	43.52	52.269	37.63	41.831	9.62
28.9	60.863	2.83	44.288	43.22	52.499	35.91	42.073	7.08
Aug. 7.8	61.225	2.50	44.621	43.08	52.750	34.36	42.343	4.85
17.8	61.608	2.36	44.972	43.09	53.015	33.01	42.634	3.01
27.8	62.002	2.44	45.334	43.23	53.289	31.94	42.940	1.61
Sept. 6.8	62.403	2.69	45.701	43.52	53.567	31.18	43.255	0.72
16.7	62.804	3.11	46.070	43.92	53.846	30.75	43.571	0.38
26.7	63.202	3.71	46.434	44.42	54.121	30.68	43.885	0.59
Oct. 6.7	63.588	4.46	46.788	45.02	54.390	30.98	44.187	1.37
16.6	63.960	5.33	47.131	45.73	54.646	31.62	44.475	2.69
26.6	64.311	6.37	47.456	46.52	54.889	32.57	44.741	4.49
Nov. 5.6	64.636	7.54	47.757	47.40	55.112	33.81	44.980	6.73
15.6	64.927	8.83	48.023	48.36	55.311	35.26	45.185	9.30
25.5	65.177	10.22	48.265	49.39	55.481	36.87	45.353	12.11
Dec. 5.5	65.382	11.68	48.459	50.48	55.621	38.56	45.478	15.06
15.5	65.531	13.17	48.606	51.62	55.722	40.27	45.557	18.05
25.5	65.622	14.67	48.699	52.77	55.783	41.92	45.586	20.96
35.4	65.653	16.13	48.736	53.88	55.802	43.48	45.565	23.70
Mean Place	59.883	16.73	43.330	55.89	52.027	35.38	42.246	11.79
Sec δ , Tan δ	1.437	+1.033	1.306	+0.840	1.007	-0.122	1.220	-0.699
$D\mu\alpha$, $D\omega\alpha$	+0.088	-0.015	+0.083	-0.011	+0.058	+0.002	+0.043	+0.009
$D\mu\delta$, $D\omega\delta$	+0.08	+0.98	+0.08	+0.98	+0.08	+0.98	+0.08	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Orionis. (Bellatrix.) Mag. 1.7		β Tauri. Mag. 1.8		17 Camelop. Mag. 5.8		β Leporis. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 20	° ' + 6 16	h m 5 21	° ' +28 32	h m 5 22	° ' +62 59	h m 5 24	° ' -20 49
	s	"	s	"	s	"	s	"
Jan. 0.4	61.236	41.54	26.813	29.89	56.51	73.02	58.043	24.58
10.4	61.243	40.70	26.823	30.32	56.49	75.30	58.026	26.75
20.4	61.205	39.96	26.785	30.72	56.36	77.39	57.964	28.70
30.4	61.126	39.32	26.697	31.06	56.15	79.22	57.860	30.36
Feb. 9.3	61.007	38.81	26.568	31.35	55.85	80.73	57.719	31.71
19.3	60.860	38.41	26.402	31.56	55.50	81.85	57.545	32.71
Mar. 1.3	60.688	38.12	26.210	31.63	55.10	82.53	57.349	33.35
11.3	60.505	37.97	26.005	31.58	54.67	82.76	57.141	33.63
21.2	60.318	37.91	25.797	31.42	54.24	82.53	56.929	33.55
31.2	60.140	37.98	25.599	31.15	53.82	81.86	56.724	33.12
Apr. 10.2	59.980	38.16	25.421	30.76	53.45	80.78	56.537	32.33
20.1	59.847	38.48	25.272	30.32	53.13	79.35	56.376	31.22
30.1	59.746	38.93	25.163	29.84	52.88	77.62	56.248	29.80
May. 10.1	59.685	39.51	25.098	29.35	52.72	75.67	56.159	28.08
20.1	59.664	40.24	25.079	28.90	52.63	73.58	56.111	26.13
30.0	59.688	41.09	25.109	28.50	52.65	71.42	56.107	23.96
June 9.0	59.755	42.05	25.189	28.16	52.75	69.26	56.149	21.63
19.0	59.865	43.12	25.317	27.94	52.94	67.15	56.233	19.20
29.0	60.011	44.29	25.486	27.81	53.21	65.20	56.359	16.72
July 8.9	60.191	45.48	25.694	27.78	53.56	63.41	56.521	14.26
18.9	60.401	46.68	25.933	27.85	53.97	61.83	56.716	11.89
28.9	60.636	47.86	26.201	28.01	54.44	60.53	56.940	9.70
Aug. 7.8	60.888	48.96	26.489	28.26	54.95	59.50	57.186	7.73
17.8	61.156	49.94	26.796	28.54	55.50	58.76	57.451	6.07
27.8	61.433	50.78	27.111	28.88	56.08	58.33	57.728	4.77
Sept. 6.8	61.715	51.40	27.433	29.24	56.67	58.23	58.013	3.89
16.7	61.999	51.83	27.756	29.61	57.26	58.44	58.301	3.45
26.7	62.280	52.01	28.079	29.96	57.86	58.98	58.588	3.49
Oct. 6.7	62.556	51.96	28.393	30.31	58.44	59.81	58.868	4.00
16.7	62.821	51.68	28.697	30.64	59.00	60.95	59.137	4.97
26.6	63.074	51.18	28.986	30.97	59.53	62.36	59.390	6.35
Nov. 5.6	63.308	50.50	29.257	31.28	60.02	64.06	59.624	8.11
15.6	63.523	49.70	29.504	31.64	60.46	66.00	59.831	10.18
25.5	63.709	48.79	29.721	32.00	60.84	68.13	60.008	12.44
Dec. 5.5	63.865	47.83	29.900	32.38	61.14	70.42	60.150	14.84
15.5	63.982	46.85	30.040	32.79	61.36	72.81	60.252	17.28
25.5	64.061	45.92	30.135	33.24	61.48	75.23	60.311	19.68
35.4	64.096	45.04	30.180	33.69	61.52	77.60	60.323	21.93
Mean Place	60.014	51.92	25.385	37.71	53.610	77.70	56.762	11.33
Sec δ , Tan δ	1.006	+0.110	1.138	+0.544	2.203	+1.963	1.070	-0.380
$D\psi\alpha$, $D\omega\alpha$	+0.064	-0.001	+0.075	-0.006	+0.113	-0.021	+0.051	+0.004
$D\psi\delta$, $D\omega\delta$	+0.07	+0.99	+0.07	+0.99	+0.06	+0.99	+0.06	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Aurigæ. Mag. 4.9		δ Orionis. Mag. 2.5		α Leporis. Mag. 2.7		Groombridge 966. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 27	° ' s +32 8	h m 5 28	° ' s - 0 21	h m 5 29	° ' s -17 52	h m 5 29	° ' s +74 59
	s	"	s	"	s	"	s	"
Jan. 0.5	44.390	3.49	5.543	29.09	21.303	48.01	30.28	40.26
10.4	44.406	4.13	5.550	30.30	21.293	50.09	30.20	43.04
20.4	44.372	4.75	5.517	31.38	21.241	51.92	29.94	45.64
30.4	44.284	5.30	5.438	32.31	21.145	53.54	29.53	47.92
Feb. 9.3	44.152	5.74	5.320	33.06	21.008	54.82	28.98	49.84
19.3	43.984	6.07	5.175	33.63	20.843	55.80	28.33	51.30
Mar. 1.3	43.786	6.27	5.003	34.01	20.653	56.43	27.60	52.27
11.3	43.572	6.28	4.819	34.22	20.450	56.75	26.82	52.64
21.2	43.355	6.15	4.633	34.25	20.245	56.69	26.03	52.50
31.2	43.147	5.87	4.453	34.10	20.046	56.31	25.27	51.83
Apr. 10.2	42.959	5.44	4.286	33.76	19.864	55.59	24.57	50.67
20.2	42.799	4.94	4.147	33.23	19.706	54.60	23.97	49.05
30.1	42.680	4.34	4.040	32.52	19.581	53.27	23.48	47.08
May 10.1	42.607	3.70	3.969	31.65	19.490	51.70	23.11	44.79
20.1	42.583	3.07	3.942	30.61	19.443	49.87	22.90	42.30
30.0	42.607	2.47	3.956	29.43	19.439	47.86	22.84	39.69
June 9.0	42.681	1.94	4.010	28.10	19.478	45.66	22.94	37.04
19.0	42.806	1.49	4.109	26.66	19.561	43.37	23.19	34.42
29.0	42.975	1.11	4.241	25.18	19.683	41.02	23.59	31.93
July 8.9	43.180	0.86	4.412	23.65	19.842	38.68	24.11	29.61
18.9	43.424	0.70	4.611	22.16	20.033	36.44	24.76	27.54
28.9	43.696	0.68	4.834	20.72	20.251	34.32	25.51	25.74
Aug. 7.9	43.992	0.73	5.079	19.40	20.494	32.43	26.35	24.26
17.8	44.303	0.85	5.340	18.25	20.754	30.82	27.26	23.14
27.8	44.627	1.07	5.610	17.30	21.028	29.56	28.22	22.41
Sept. 6.8	44.961	1.33	5.889	16.61	21.310	28.69	29.22	22.05
16.7	45.296	1.61	6.170	16.18	21.595	28.24	30.23	22.11
26.7	45.631	1.94	6.448	16.09	21.880	28.25	31.25	22.57
Oct. 6.7	45.957	2.29	6.721	16.25	22.159	28.68	32.25	23.43
16.7	46.276	2.68	6.986	16.74	22.427	29.55	33.21	24.69
26.6	46.581	3.08	7.238	17.49	22.682	30.85	34.12	26.29
Nov. 5.6	46.864	3.54	7.475	18.44	22.918	32.50	34.95	28.24
15.6	47.127	4.00	7.689	19.61	23.131	34.43	35.69	30.54
25.6	47.357	4.55	7.878	20.89	23.311	36.57	36.31	33.10
Dec. 5.5	47.550	5.13	8.033	22.26	23.458	38.85	36.81	35.82
15.5	47.701	5.76	8.153	23.63	23.565	41.16	37.15	38.72
25.5	47.806	6.42	8.232	24.97	23.631	43.45	37.34	41.65
35.4	47.858	7.08	8.268	26.23	23.654	45.60	37.35	44.54
Mean Place	42.897	11.23	4.324	17.92	20.031	35.14	25.137	44.74
Sec δ , Tan δ	1.181	+0.628	1.000	-0.006	1.051	-0.323	3.862	+3.730
$D\psi\alpha$, $D\omega\alpha$	+0.078	-0.006	+0.061	0.000	+0.053	+0.003	+0.159	-0.033
$D\psi\delta$, $D\omega\delta$	+0.06	+0.99	+0.06	+0.99	+0.05	+0.99	+0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ^1 Orionis. Mag. 4.5		ι Orionis. Mag. 2.9		ϵ Orionis. Mag. 1.8		ζ Tauri. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 30 s	° ' " + 9 26 "	h m 5 31 s	° ' " - 5 57 "	h m 5 32 s	° ' " - 1 14 "	h m 5 33 s	° ' " +21 5 "
Jan. 0.5	36.785	18 8.52	41.193	45.50	19.564	70.89	3.870	39.34
10.4	36.803	18 7.85	41.200	47.03	19.574	72.17	3.893	39.33
20.4	36.774	29 7.25	41.164	48.38	19.542	73.30	3.868	39.36
30.4	36.701	73 6.75	41.084	49.53	19.465	74.28	3.795	39.40
Feb. 9.3	36.589	112 6.35	40.965	50.48	19.351	75.06	3.680	39.45
19.3	36.446	143 6.04	40.816	51.20	19.206	75.65	3.530	39.48
Mar. 1.3	36.276	170 5.82	40.643	51.67	19.036	76.07	3.353	39.48
11.3	36.092	184 5.68	40.455	51.92	18.852	76.30	3.161	39.45
21.2	35.904	188 5.62	40.264	51.94	18.665	76.32	2.964	39.36
31.2	35.723	181 5.64	40.079	51.71	18.483	76.16	2.774	39.25
Apr. 10.2	35.559	164 5.76	39.911	51.26	18.314	75.81	2.601	39.10
20.2	35.419	140 5.98	39.766	50.57	18.173	75.26	2.455	38.95
30.1	35.313	108 6.29	39.652	49.69	18.064	74.53	2.343	38.81
May 10.1	35.245	68 6.72	39.576	48.58	17.989	73.66	2.273	38.70
20.1	35.219	26 7.26	39.539	47.28	17.957	72.58	2.244	38.64
June 30.0	35.236	17 7.93	39.546	45.82	17.966	71.34	2.264	38.65
9.0	35.297	61 8.70	39.595	44.21	18.018	69.98	2.329	38.74
19.0	35.400	103 9.57	39.683	42.50	18.110	68.51	2.439	38.93
29.0	35.540	140 10.51	39.811	40.72	18.239	66.99	2.587	39.19
July 8.9	35.715	175 11.50	39.975	38.93	18.404	65.45	2.773	39.52
Aug. 18.9	35.921	206 12.52	40.169	37.19	18.600	63.91	2.991	39.92
28.9	36.151	230 13.52	40.388	35.53	18.820	62.44	3.235	40.37
7.9	36.403	252 14.47	40.627	34.00	19.062	61.09	3.502	40.83
17.8	36.668	265 15.33	40.883	32.71	19.319	59.93	3.785	41.28
27.8	36.945	277 16.04	41.152	31.66	19.589	58.96	4.079	41.72
Sept. 6.8	37.229	284 16.61	41.427	30.89	19.866	58.27	4.380	42.10
16.7	37.514	285 16.99	41.706	30.46	20.146	57.85	4.684	42.41
26.7	37.800	286 17.16	41.984	30.38	20.425	57.73	4.988	42.65
Oct. 6.7	38.080	280 17.13	42.258	30.65	20.699	57.93	5.287	42.77
16.7	38.353	273 16.90	42.523	31.26	20.965	58.46	5.578	42.83
Nov. 26.6	38.613	260 16.49	42.777	32.19	21.219	59.23	5.858	42.83
5.6	38.859	246 15.92	43.012	33.40	21.459	60.24	6.121	42.73
15.6	39.083	224 15.22	43.227	34.82	21.675	61.44	6.363	42.61
25.6	39.281	198 14.45	43.414	36.42	21.867	62.81	6.578	42.49
Dec. 5.5	39.447	166 13.65	43.571	38.10	22.025	64.23	6.760	42.37
15.5	39.577	130 12.84	43.689	39.80	22.148	65.67	6.904	42.28
25.5	39.668	91 12.07	43.769	41.47	22.232	67.07	7.006	42.24
35.4	39.714	46 11.38	43.804	43.04	22.270	68.39	7.060	42.23
Mean Place	35.535	18.72	39.965	33.77	18.338	59.62	2.531	48.42
Sec δ , Tan δ	1.014	+0.166	1.005	-0.104	1.000	-0.022	1.072	+0.386
$D\phi_a$, $D\omega_a$	+0.066	-0.001	+0.058	+0.001	+0.061	0.000	+0.071	-0.003
$D\phi\delta$, $D\omega\delta$	+0.05	+0.99	+0.05	+0.99	+0.05	+0.99	+0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Columbae. Mag. 2.8		ζ Orionis. Mag. 2.0		ϵ Aurigae. Mag. 5.5		ζ Leporis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 36	° ' -34 6	h m 5 36	° ' - 1 58	h m 5 39	° ' +49 47	h m 5 43	° ' -14 50
	s	"	s	"	s	"	s	"
Jan. 0.5	53.134	65.89	53.625	67.71	57.971	32.02	29.238	70.88
10.4	53.104	68.60	53.640	69.04	57.996	33.68	29.246	72.89
20.4	53.022	71.09	53.610	70.22	57.951	35.23	29.210	74.69
30.4	52.895	73.20	53.537	71.23	57.839	36.65	29.129	76.25
Feb. 9.3	52.725	74.92	53.425	72.06	57.667	37.84	29.006	77.53
19.3	52.521	76.26	53.281	72.68	57.443	38.78	28.853	78.52
Mar. 1.3	52.289	77.13	53.112	73.12	57.180	39.40	28.672	79.19
11.3	52.041	77.54	52.928	73.34	56.895	39.71	28.475	79.56
21.2	51.791	77.51	52.739	73.38	56.602	39.66	28.273	79.60
31.2	51.547	77.03	52.555	73.21	56.316	39.30	28.077	79.33
Apr. 10.2	51.319	76.11	52.387	72.86	56.054	38.61	27.893	78.76
20.2	51.117	74.81	52.242	72.31	55.827	37.66	27.732	77.89
30.1	50.948	73.09	52.129	71.57	55.650	36.49	27.603	76.75
May 10.1	50.822	71.04	52.052	70.65	55.531	35.15	27.507	75.34
20.1	50.735	68.70	52.015	69.54	55.466	33.68	27.452	73.70
30.0	50.697	66.12	52.020	68.29	55.470	32.15	27.440	71.86
June 9.0	50.707	63.32	52.067	66.91	55.538	30.63	27.471	69.85
19.0	50.766	60.42	52.155	65.43	55.669	29.13	27.541	67.74
29.0	50.872	57.47	52.281	63.87	55.857	27.74	27.654	65.56
July 8.9	51.019	54.56	52.442	62.29	56.100	26.46	27.800	63.38
18.9	51.206	51.76	52.633	60.73	56.390	25.34	27.982	61.24
28.9	51.428	49.16	52.851	59.24	56.722	24.39	28.190	59.24
Aug. 7.9	51.679	46.86	53.089	57.87	57.084	22.65	28.421	57.44
17.8	51.954	44.90	53.344	56.69	57.475	23.10	28.671	55.87
27.8	52.249	43.37	53.610	55.72	57.884	22.74	28.937	54.64
Sept. 6.8	52.556	42.34	53.885	55.02	58.306	22.59	29.213	53.76
16.7	52.870	41.81	54.164	54.60	58.736	22.64	29.494	53.27
26.7	53.184	41.85	54.443	54.51	59.167	22.91	29.777	53.22
Oct. 6.7	53.494	42.47	54.718	54.73	59.596	23.35	30.056	53.59
16.7	53.790	43.64	54.986	55.25	60.012	24.02	30.328	54.39
26.6	54.069	45.27	55.242	56.07	60.411	24.85	30.589	55.57
Nov. 5.6	54.326	47.37	55.483	57.13	60.787	25.89	30.834	57.09
15.6	54.553	49.85	55.702	58.39	61.131	27.11	31.056	58.91
25.6	54.745	52.61	55.896	59.78	61.437	28.50	31.251	60.92
Dec. 5.5	54.896	55.55	56.060	61.26	61.693	30.01	31.412	63.08
15.5	55.000	58.55	56.188	62.76	61.895	31.63	31.537	65.28
25.5	55.055	61.50	56.275	64.22	62.033	33.31	31.620	67.45
35.4	55.058	64.32	56.319	65.55	62.103	35.01	31.658	69.52
Mean Place	51.645	52.05	52.390	56.36	55.981	38.93	27.952	58.58
Sec δ , Tan δ	1.208	-0.677	1.001	-0.035	1.549	+1.183	1.035	-0.265
$D\psi\alpha$, $D\omega\alpha$	+0.043	+0.005	+0.060	0.000	+0.092	-0.007	+0.054	+0.001
$D\psi\delta$, $D\omega\delta$	+0.04	+0.99	+0.04	+0.99	+0.03	+1.00	+0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Orionis. Mag. 2.2		δ Doradus. Mag. 4.5		ν Aurigæ. Mag. 4.2		δ Leporis. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 44	° ' " - 9 41	h m 5 44	° ' " -65 45	h m 5 46	° ' " +39 7	h m 5 47	° ' " -20 52
	s	"	s	"	s	"	s	"
Jan. 0.5	7.519 13	57.18 176	41.06 18	66.43 330	10.778 39	31.02 106	61.906 6	77.25 231
10.4	7.532 33	58.94 158	40.88 28	69.73 299	10.817 21	32.08 102	61.912 41	79.56 208
20.4	7.499 73	60.52 137	40.60 36	72.72 258	10.796 78	33.10 95	61.871 87	81.64 183
30.4	7.426 116	61.89 110	40.24 43	75.30 216	10.718 131	34.05 83	61.784 128	83.47 150
Feb. 9.4	7.310 147	62.99 86	39.81 49	77.46 163	10.587 176	34.88 66	61.656 163	84.97 117
19.3	7.163 173	63.85 59	39.32 54	79.09 111	10.411 210	35.54 46	61.493 188	86.14 81
Mar. 1.3	6.990 189	64.44 32	38.78 57	80.20 55	10.201 231	36.00 24	61.305 206	86.95 47
11.3	6.801 195	64.76 6	38.21 57	80.75 1	9.970 210	36.24 1	61.099 213	87.42 8
21.2	6.606 190	64.82 21	37.64 56	80.74 53	9.730 235	36.25 23	60.886 208	87.50 27
31.2	6.416 176	64.61 49	37.08 54	80.21 106	9.495 215	36.02 42	60.678 195	87.23 62
Apr. 10.2	6.240 155	64.12 75	36.54 50	79.15 156	9.280 188	35.60 62	60.483 172	86.61 95
20.2	6.085 122	63.37 95	36.04 44	77.59 200	9.092 148	34.98 77	60.311 143	85.66 127
30.1	5.963 91	62.42 122	35.60 38	75.59 243	8.944 101	34.21 88	60.168 106	84.39 157
May 10.1	5.872 49	61.20 143	35.22 30	73.16 276	8.843 49	33.33 95	60.062 68	82.82 183
20.1	5.823 6	59.77 161	34.92 22	70.40 308	8.794 5	32.38 97	59.994 23	80.99 206
30.1	5.817 33	58.16 174	34.70 12	67.32 327	8.799 58	31.41 95	59.971 19	78.93 222
June 9.0	5.850 75	56.42 187	34.58 2	64.05 342	8.857 111	30.46 91	59.990 63	76.71 235
19.0	5.925 116	54.55 194	34.56 5	60.63 316	8.968 160	29.55 84	60.053 103	74.36 242
29.0	6.041 147	52.61 195	34.61 15	57.17 340	9.128 205	28.71 72	60.156 141	71.94 242
July 8.9	6.188 181	50.66 191	34.76 23	53.77 327	9.333 244	27.99 63	60.297 176	69.52 235
18.9	6.369 209	48.75 179	34.99 31	50.50 303	9.577 277	27.36 50	60.473 205	67.17 221
28.9	6.578 230	46.96 164	35.30 39	47.47 270	9.854 306	26.86 39	60.678 231	64.96 199
Aug. 7.9	6.808 251	45.32 114	35.69 45	44.77 229	10.160 327	26.47 25	60.909 253	62.97 170
17.8	7.059 263	43.88 111	36.14 50	42.48 178	10.487 343	26.22 15	61.462 267	61.27 135
27.8	7.322 274	42.77 82	36.64 54	40.70 121	10.830 356	26.07 4	61.429 279	59.92 96
Sept. 6.8	7.596 279	41.95 46	37.18 56	39.49 58	11.186 361	26.03 7	61.708 287	58.96 52
16.8	7.875 281	41.49 6	37.74 56	38.91 5	11.547 363	26.10 16	61.995 288	58.44 4
26.7	8.156 276	41.43 31	38.30 56	38.96 71	11.910 361	26.26 27	62.283 286	58.40 44
Oct. 6.7	8.432 270	41.74 69	38.86 54	39.67 136	12.271 353	26.53 36	62.569 280	58.84 91
16.7	8.702 263	42.43 105	39.40 50	41.03 196	12.624 342	26.89 46	62.849 268	59.75 134
26.6	8.965 243	43.48 134	39.90 42	42.99 246	12.966 325	27.35 57	63.117 219	61.09 174
Nov. 5.6	9.208 221	44.82 160	40.32 36	45.45 292	13.291 300	27.92 68	63.366 228	62.83 205
15.6	9.429 199	46.42 180	40.68 28	48.37 326	13.591 288	28.60 78	63.594 199	64.88 229
25.6	9.628 162	48.22 189	40.96 19	51.63 348	13.859 230	29.38 89	63.793 165	67.17 244
Dec. 5.5	9.790 128	50.11 194	41.15 9	55.11 358	14.089 184	30.27 98	63.958 126	69.61 251
15.5	9.918 90	52.05 192	41.24 2	58.69 355	14.273 133	31.25 104	64.084 82	72.12 249
25.5	10.008 44	53.97 179	41.22 12	62.24 341	14.406 76	32.29 108	64.166 37	74.61 238
35.5	10.052	55.76	41.10	65.65	14.482	33.37	64.203	76.99
Mean Place	6.256	45.27	37.928	51.95	9.144	39.13	60.562	64.65
Sec δ , Tan δ	1.014	-0.171	2.436	-2.222	1.289	+0.813	1.070	-0.382
$D\psi\alpha$, $D\omega\alpha$	+0.057	+0.001	+0.002	+0.010	+0.083	-0.003	+0.051	+0.001
$D\psi\delta$, $D\omega\delta$	+0.03	+1.00	+0.03	+1.00	+0.02	+1.00	+0.02	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Orionis. (Betelgeux.) Var. 1.0-1.4		η Leporis. Mag. 3.8		δ Aurigæ. Mag. 3.9		β Aurigæ. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 50	° ' + 7 23	h m 5 52	° ' -14 10	h m 5 53	° ' +54 16	h m 5 53	° ' +44 56
	s	"	s	"	s	"	s	"
Jan. 0.5	61.435	27.53	55.157	62.69	13.476	43.12	54.667	20.36
10.4	61.468	26.69	55.175	64.69	13.519	45.02	54.715	21.76
20.4	61.455	25.96	55.147	66.50	13.482	46.84	54.695	23.12
30.4	61.397	25.35	55.073	68.07	13.372	48.51	54.612	24.36
Feb. 9.4	61.297	24.86	54.959	69.37	13.191	49.98	54.474	25.45
19.3	61.164	24.49	54.811	70.38	12.952	51.15	54.282	26.35
Mar. 1.3	61.003	24.23	54.634	71.08	12.668	52.00	54.056	27.01
11.3	60.823	24.09	54.441	71.49	12.353	52.49	53.802	27.38
21.3	60.636	24.05	54.240	71.58	12.026	52.62	53.537	27.49
31.2	60.451	24.12	54.043	71.36	11.704	52.35	53.277	27.29
Apr. 10.2	60.282	24.28	53.857	70.85	11.404	51.72	53.034	26.80
20.2	60.135	24.56	53.693	70.04	11.139	50.78	52.823	26.10
30.1	60.017	24.95	53.558	68.95	10.926	49.56	52.649	25.18
May 10.1	59.932	25.47	53.458	67.62	10.769	48.12	52.527	24.12
20.1	59.887	26.09	53.397	66.04	10.677	46.51	52.461	22.92
30.1	59.886	26.84	53.377	64.27	10.656	44.79	52.452	21.66
June 9.0	59.927	27.69	53.399	62.33	10.705	43.03	52.499	20.39
19.0	60.009	28.58	53.463	60.27	10.822	41.29	52.605	19.15
29.0	60.129	29.59	53.566	58.13	11.006	39.61	52.768	17.95
July 8.9	60.285	30.63	53.704	55.99	11.248	38.02	52.975	16.86
18.9	60.471	31.69	53.877	53.91	11.545	36.58	53.227	15.88
28.9	60.683	32.71	54.079	51.93	11.890	35.34	53.521	15.04
Aug. 7.9	60.920	33.66	54.303	50.13	12.274	34.28	53.845	14.35
17.8	61.174	34.50	54.548	48.58	12.688	33.41	54.196	13.79
27.8	61.441	35.21	54.809	47.33	13.129	32.79	54.563	13.43
Sept. 6.8	61.718	35.73	55.081	46.43	13.587	32.40	54.948	13.18
16.8	62.001	36.06	55.360	45.93	14.057	32.23	55.342	13.11
26.7	62.286	36.14	55.641	45.84	14.533	32.32	55.739	13.18
Oct. 6.7	62.570	36.01	55.922	46.18	15.006	32.63	56.135	13.42
16.7	62.851	35.67	56.198	46.95	15.470	33.20	56.523	13.81
26.6	63.119	35.12	56.463	48.10	15.918	34.00	56.903	14.36
Nov. 5.6	63.375	34.40	56.712	49.59	16.344	35.05	57.260	15.06
15.6	63.615	33.52	56.942	51.37	16.736	36.33	57.593	15.95
25.6	63.827	32.58	57.144	53.36	17.085	37.80	57.893	16.98
Dec. 5.5	64.012	31.59	57.316	55.50	17.384	39.47	58.150	18.16
15.5	64.160	30.60	57.450	57.68	17.621	41.27	58.357	19.43
25.5	64.268	29.66	57.544	59.84	17.789	43.17	58.506	20.82
35.5	64.332	28.77	57.593	61.90	17.883	45.11	58.595	22.23
Mean Place	60.171	38.18	53.855	50.62	11.289	50.66	52.876	28.51
Sec δ , Tan δ	1.008	+0.130	1.031	-0.253	1.713	+1.391	1.413	+0.998
$D\psi\alpha$, $D\omega\alpha$	+0.065	0.000	+0.054	+0.001	+0.098	-0.003	+0.088	-0.002
$D\psi\delta$, $D\omega\delta$	+0.02	+1.00	+0.01	+1.00	+0.01	+1.00	+0.01	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aurigæ. Mag. 2.7		1 Geminorum. Mag. 4.3		1 G. Puppis. Mag. 6.2		ν Orionis. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 5 54	° ' " +37 12	h m 5 59	° ' " +23 15	h m 6 2	° ' " -45 1	h m 6 3	° ' " +14 46
	s	"	s	"	s	"	s	"
Jan. 0.5	29.819	22.33	27.757	57.79	17.303	82.47	11.871	33.71
10.4	29.869	23.28	27.809	57.88	17.275	85.62	11.918	33.29
20.4	29.855	24.21	27.807	58.03	17.186	88.52	11.921	32.96
30.4	29.787	25.11	27.756	58.21	17.039	91.09	11.872	32.69
Feb. 9.4	29.669	25.89	27.660	58.41	16.841	93.26	11.781	32.52
19.3	29.504	26.51	27.522	58.60	16.602	94.98	11.653	32.41
Mar. 1.3	29.303	26.99	27.353	58.75	16.328	96.22	11.493	32.34
11.3	29.085	27.25	27.163	58.85	16.032	96.97	11.313	32.32
21.3	28.853	27.34	26.964	58.89	15.725	97.21	11.124	32.33
31.2	28.621	27.18	26.766	58.87	15.422	96.95	10.936	32.36
Apr. 10.2	28.409	26.86	26.581	58.79	15.130	96.20	10.760	32.43
20.2	28.226	26.34	26.420	58.66	14.863	94.99	10.604	32.52
30.1	28.076	25.69	26.290	58.51	14.628	93.33	10.478	32.67
May 10.1	27.972	24.92	26.197	58.34	14.435	91.28	10.388	32.88
20.1	27.916	24.08	26.148	58.19	14.287	88.87	10.338	33.15
30.1	27.910	23.22	26.143	58.07	14.191	86.15	10.328	33.47
June 9.0	27.961	22.37	26.184	58.00	14.149	83.22	10.362	33.88
19.0	28.059	21.56	26.269	57.98	14.160	80.10	10.436	34.37
29.0	28.207	20.82	26.396	58.03	14.224	76.90	10.553	34.90
July 9.0	28.399	20.12	26.561	58.14	14.339	73.71	10.703	35.47
18.9	28.627	19.56	26.759	58.29	14.503	70.62	10.887	36.08
28.9	28.889	19.08	26.986	58.48	14.712	67.70	11.097	36.69
Aug. 7.9	29.184	18.72	27.239	58.70	14.961	65.06	11.335	37.28
17.8	29.496	18.42	27.510	58.91	15.244	62.78	11.589	37.78
27.8	29.829	18.24	27.798	59.10	15.555	60.95	11.860	38.22
Sept. 6.8	30.175	18.17	28.096	59.26	15.887	59.62	12.142	38.56
16.8	30.528	18.17	28.402	59.37	16.236	58.86	12.433	38.75
26.7	30.884	18.22	28.712	59.41	16.591	58.70	12.726	38.76
Oct. 6.7	31.238	18.38	29.021	59.38	16.945	59.17	13.021	38.66
16.7	31.587	18.64	29.326	59.30	17.291	60.24	13.311	38.42
26.7	31.928	18.94	29.624	59.17	17.621	61.89	13.595	37.99
Nov. 5.6	32.250	19.36	29.910	59.00	17.926	64.06	13.868	37.50
15.6	32.551	19.88	30.176	58.83	18.199	66.69	14.123	36.93
25.6	32.823	20.50	30.419	58.68	18.430	69.63	14.356	36.30
Dec. 5.5	33.055	21.24	30.630	58.57	18.615	72.83	14.557	35.69
15.5	33.245	22.07	30.804	58.52	18.746	76.16	14.725	35.10
25.5	33.386	22.94	30.934	58.53	18.818	79.50	14.851	34.58
35.5	33.473	23.89	31.018	58.61	18.828	82.75	14.932	34.13
Mean Place	28.235	31.02	26.391	67.57	15.438	69.59	10.569	44.07
Sec δ , Tan δ	1.256	+0.759	1.089	+0.430	1.415	-1.001	1.034	+0.264
$D_{\alpha\alpha}$, $D_{\omega\alpha}$	+0.081	-0.001	+0.073	0.000	+0.035	-0.001	+0.068	0.000
$D_{\beta\delta}$, $D_{\omega\delta}$	+0.01	+1.00	0.00	+1.00	0.00	+1.00	-0.01	+1.00

APPARENT PLACES OF STARS, 1923.

369

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	7 Geminorum. Var. 3.2-4.2		22 H. Camelop. Mag. 4.7		2 Lyncis. Mag. 4.4		5 Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 10	° ' " +22 31	h m 6 10	° ' " +69 20	h m 6 12	° ' " +59 2	h m 6 17	° ' " -30 1
Jan. 0.5	15.190	61 39.40	25.51	7 49.43	52.425	75 18.40	22.875	22 54.94
10.5	15.251	8 39.44	25.58	6 52.05	52.500	215 20.55	22.897	22 57.73
20.4	15.259	40 39.54	25.52	6 54.59	52.486	210 22.65	22.866	31 60.32
30.4	15.219	40 39.71	25.33	19 56.97	52.383	199 24.64	22.784	82 62.61
Feb. 9.4	15.129	90 39.88	25.03	30 59.10	52.199	181 26.42	22.657	127 64.58
	130	19	40	175	255	150	168	160
19.3	14.999	40.07	24.63	60.85	51.944	27.92	22.489	66.18
Mar. 1.3	14.836	163 40.24	24.15	48 62.18	51.632	312 29.08	22.290	199 67.35
11.3	14.651	185 40.38	23.62	53 63.06	51.280	352 29.86	22.068	222 68.12
21.3	14.455	196 40.48	23.06	56 63.45	50.908	372 30.22	21.834	234 68.46
31.2	14.259	196 40.50	22.50	56 63.32	50.535	373 30.18	21.599	235 68.37
	188	2	54	62	355	47	226	49
Apr. 10.2	14.071	40.48	21.96	62.70	50.180	29.71	21.373	67.88
20.2	13.907	164 40.42	21.48	48 61.63	49.859	321 28.86	21.166	207 66.99
30.2	13.772	135 40.34	21.06	42 60.19	49.586	273 27.67	20.986	180 65.69
May 10.1	13.674	98 40.24	20.73	33 58.38	49.376	210 26.21	20.838	148 64.06
20.1	13.614	60 40.15	20.50	23 56.29	49.236	140 24.51	20.729	109 62.10
	15	9	12	227	66	186	66	223
30.1	13.599	30 40.06	20.38	1 54.02	49.170	13 22.65	20.663	22 59.87
June 9.0	13.629	71 40.04	20.37	10 51.61	49.183	89 20.69	20.641	196 57.42
19.0	13.700	40.05	20.47	21 49.15	49.272	89 18.70	20.663	199 54.80
29.0	13.818	118 40.10	20.68	21 46.71	49.436	164 16.72	20.727	198 52.09
July 9.0	13.968	150 40.20	20.99	31 44.36	49.669	233 14.82	20.835	190 49.36
	188	16	41	220	297	179	145	270
18.9	14.156	40.36	21.40	42.16	49.966	13.03	20.980	46.66
28.9	14.372	216 40.55	21.89	49 40.14	50.319	353 11.41	21.161	162 44.11
Aug. 7.9	14.616	244 40.71	22.45	56 38.36	50.722	403 9.97	21.375	141 41.78
17.9	14.878	262 40.89	23.08	63 36.84	51.165	443 8.75	21.613	122 39.73
27.8	15.159	281 41.06	23.75	67 35.63	51.641	476 7.76	21.875	99 38.06
	294	8	72	90	501	73	282	122
Sept. 6.8	15.453	41.14	24.47	34.73	52.145	7.03	22.157	48 36.84
16.8	15.753	300 41.18	25.22	75 34.18	52.665	520 6.55	22.451	48 36.08
26.7	16.062	309 41.14	25.98	76 34.01	53.199	534 6.35	22.754	20 35.86
Oct. 6.7	16.372	310 41.05	26.74	76 34.16	53.734	535 6.43	23.060	8 36.18
16.7	16.681	309 40.87	27.50	76 34.72	54.266	532 6.81	23.363	38 37.04
	301	22	73	89	518	67	294	137
26.7	16.982	40.65	28.23	35.61	54.784	7.48	23.657	38.41
Nov. 5.6	17.270	288 40.39	28.93	70 36.92	55.280	496 8.43	23.936	95 40.23
15.6	17.543	273 40.12	29.57	64 38.53	55.741	461 9.67	24.194	124 42.48
25.6	17.794	251 39.89	30.14	57 40.48	56.159	418 11.17	24.423	150 45.04
Dec. 5.6	18.016	222 39.67	30.63	49 42.67	56.521	362 12.91	24.616	174 47.82
	183	14	38	244	295	194	152	291
15.5	18.199	39.53	31.01	45.11	56.816	14.85	24.768	50.73
25.5	18.339	140 39.46	31.28	27 47.69	57.032	216 16.95	24.873	105 53.66
35.5	18.432	93 39.47	31.43	15 50.35	57.165	133 19.11	24.927	54 56.51
Mean Place	13.835	49.55	21.932	57.52	49.993	27.10	21.341	43.21
Sec δ , Tan δ	1.083	+0.415	2.835	+2.653	1.944	+1.667	1.155	-0.578
$D\psi\alpha$, $D\omega\alpha$	+0.072	+0.001	+0.131	+0.008	+0.105	+0.006	+0.046	-0.003
$D\psi\delta$, $D\omega\delta$	-0.02	+1.00	-0.02	+1.00	-0.02	+1.00	-0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Geminorum. Mag. 3.2		ψ^1 Aurigæ. Mag. 5.1		β Canis Majoris. Mag. 2.0		δ Monocerotis. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 18	° ' " +22 33	h m 6 18	° ' " +49 19	h m 6 19	° ' " -17 54	h m 6 19	° ' " + 4 37
	s	"	s	"	s	"	s	"
Jan. 0.5	19.521 ⁶⁹	5.73	60.189 ⁸¹	34.73 ¹⁶³	19.881 ³⁹	71.17 ²³⁰	42.579 ⁵⁹	48.41 ¹⁰⁸
10.5	19.590 ¹⁷	5.76	60.270 ¹⁰	36.36 ¹⁶³	19.920 ¹¹	73.47 ²⁰⁹	42.638 ¹¹	47.33 ⁹⁴
20.4	19.607 ³²	5.85	60.280 ⁶¹	37.99 ¹⁵⁶	19.909 ⁵⁵	75.56 ¹⁸⁶	42.649 ³⁴	46.39 ⁸⁰
30.4	19.575 ⁸²	6.02	60.219 ¹²⁸	39.55 ¹⁴⁵	19.851 ¹⁰²	77.42 ¹⁵⁷	42.615 ⁷⁹	45.59 ⁶³
Feb. 9.4	19.493 ¹²⁴	6.21	60.091 ¹⁸⁵	41.00 ¹²⁰	19.752 ¹⁴⁰	78.99 ¹²⁷	42.536 ¹²⁰	44.96 ⁴⁸
19.3	19.369	6.42	59.906	42.20	19.612	80.26	42.416	44.48
Mar. 1.3	19.209 ¹⁶⁰	6.62	59.674 ²³²	43.19 ⁹⁹	19.441 ¹⁷¹	81.20 ⁹⁴	42.266 ¹⁵⁰	44.14 ³⁴
11.3	19.025 ¹⁸⁴	6.78	59.406 ²⁶⁸	43.86 ⁶⁷	19.249 ¹⁹²	81.79 ⁵⁹	42.094 ¹⁷²	43.96 ¹⁸
21.3	18.832 ¹⁹³	6.93	59.122 ²⁸⁴	44.22 ³⁶	19.044 ²⁰⁵	82.06 ²⁷	41.910 ¹⁸⁴	43.91 ⁵
31.2	18.635 ¹⁹⁷	6.98	58.834 ²⁸⁸	44.26 ⁴	18.839 ²⁰⁵	81.97 ⁹	41.723 ¹⁸⁷	44.00 ⁹
	190	0	275	28	197	40	176	21
Apr. 10.2	18.445	6.98	58.559	43.98	18.642	81.57	41.547	44.21
20.2	18.277 ¹⁶⁸	6.94	58.314 ²⁴⁵	43.37 ⁶¹	18.464 ¹⁷⁸	80.84 ⁷³	41.387 ¹⁶⁰	44.55 ³⁴
30.2	18.139 ¹³⁸	6.90	58.102 ²¹²	42.51 ⁸⁶	18.309 ¹⁵⁵	79.81 ¹⁰³	41.254 ¹³³	45.01 ⁴⁶
May 10.1	18.035 ¹⁰⁴	6.80	57.941 ¹⁶¹	41.41 ¹¹⁰	18.188 ¹²¹	78.49 ¹³²	41.153 ¹⁰¹	45.61 ⁶⁰
20.1	17.970 ⁶⁵	6.72	57.837 ¹⁰⁴	40.16 ¹²⁵	18.101 ⁸⁷	76.91 ¹⁵⁸	41.089 ⁶⁴	46.32 ⁷¹
	23	9	17	140	47	181	28	83
30.1	17.947 [—]	6.63	57.790	38.76	18.054	75.10	41.061	47.15
June 9.0	17.970 ²³	6.59	57.805 ¹⁵	37.29 ¹⁴⁷	18.049 ⁵	73.10 ²⁰⁰	41.075 ¹¹	48.06 ⁹¹
19.0	18.035 ⁶⁵	6.59	57.880 ⁷⁵	35.78 ¹⁵¹	18.084 ³⁵	70.97 ²¹³	41.130 ⁵⁵	49.08 ¹⁰²
29.0	18.143 ¹⁰⁸	6.60	58.015 ¹³⁵	34.27 ¹⁵¹	18.159 ⁷⁵	68.74 ²²³	41.223 ⁹³	50.15 ¹⁰⁷
July 9.0	18.287 ¹⁴¹	6.69	58.201 ¹⁸⁶	32.80 ¹⁴⁷	18.271 ¹¹²	66.49 ²²⁵	41.351 ¹²⁸	51.26 ¹¹¹
	180	12	239	134	147	221	161	110
18.9	18.467	6.81	58.440	31.46	18.418	64.28	41.512	52.36
28.9	18.677 ²¹⁰	6.93	58.727 ²⁸⁷	30.21 ¹²⁵	18.597 ¹⁷⁹	62.16 ²¹²	41.699 ¹⁸⁷	53.43 ¹⁰⁷
Aug. 7.9	18.916 ²³⁹	7.04	59.048 ³²¹	29.11 ¹¹⁰	18.803 ²⁰⁶	60.23 ¹⁹³	41.912 ²¹³	54.41 ⁹⁸
17.9	19.173 ²⁵⁷	7.19	59.402 ³⁵⁴	28.16 ⁹⁵	19.032 ²²⁹	58.54 ¹⁶⁹	42.148 ²³⁶	55.29 ⁸⁸
27.8	19.450 ²⁷⁷	7.28	59.782 ³⁸⁰	27.36 ⁸⁰	19.281 ²¹⁹	57.15 ¹³⁹	42.398 ²⁵⁰	55.98 ⁶⁹
	292	3	405	62	265	101	264	49
Sept. 6.8	19.742	7.31	60.187	26.74	19.546	56.14	42.662	56.47
16.8	20.040 ²⁹⁸	7.30	60.603 ⁴¹⁶	26.32 ⁴²	19.822 ²⁷⁶	55.54 ⁶⁰	42.937 ²⁷⁵	56.74 ²⁷
26.7	20.348 ³⁰⁸	7.19	61.029 ⁴²⁶	26.05 ²⁷	20.106 ²⁸⁴	55.36 ¹⁸	43.217 ²⁸⁰	56.76 ²
Oct. 6.7	20.659 ³¹¹	7.03	61.460 ⁴³¹	26.01 ⁴	20.394 ²⁸⁸	55.66 ³⁰	43.503 ²⁸⁶	56.52 ²⁴
16.7	20.970 ³¹¹	6.77	61.892 ⁴³²	26.17 ¹⁶	20.680 ²⁸⁶	56.40 ⁷⁴	43.786 ²⁸³	56.04 ⁴⁸
	304	25	421	37	279	119	278	73
26.7	21.274	6.52	62.313	26.54	20.959	57.59	44.064	55.31
Nov. 5.6	21.568 ²⁹⁴	6.20	62.719 ⁴⁰⁶	27.12 ⁵⁸	21.226 ²⁶⁷	59.14 ¹⁵⁵	44.335 ²⁷¹	54.40 ⁹¹
15.6	21.849 ²⁸¹	5.89	63.102 ³⁸³	27.91 ⁷⁹	21.476 ²⁵⁰	61.03 ¹⁸⁹	44.589 ²⁵⁴	53.32 ¹⁰⁸
25.6	22.104 ²⁵⁵	5.60	63.451 ³⁴⁹	28.95 ¹⁰⁴	21.702 ²²⁶	63.19 ²¹⁶	44.824 ²³⁵	52.14 ¹¹⁸
Dec. 5.6	22.333 ²²⁹	5.32	63.758 ³⁰⁷	30.17 ¹²²	21.897 ¹⁹⁵	65.52 ²³³	45.031 ²⁰⁷	50.90 ¹²⁴
	190	17	254	141	158	242	172	125
15.5	22.523	5.15	64.012	31.58	22.055	67.94	45.203	49.65
25.5	22.673 ¹⁵⁰	5.06	64.208 ¹⁹⁶	33.08 ¹⁵⁰	22.171 ¹¹⁶	70.36 ²⁴²	45.337 ¹³⁴	48.44 ¹²¹
35.5	22.774 ¹⁰¹	5.06	64.336 ¹²⁸	34.72 ¹⁶⁴	22.241 ⁷⁰	72.69 ²³³	45.427 ⁹⁰	47.34 ¹¹⁰
Mean Place	18.170	16.11	58.292	44.18	18.505	59.71	41.306	59.36
Sec δ , Tan δ	1.083	+0.415	1.534	+1.164	1.051	-0.323	1.003	+0.081
$D\psi\alpha$, $D\omega\alpha$	+0.072	+0.002	+0.092	+0.006	+0.053	-0.002	+0.063	0.000
$D\psi\delta$, $D\omega\delta$	-0.03	+1.00	-0.03	+1.00	-0.03	+1.00	-0.03	+1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Argus. (Canopus.) Mag. -0.9		10 Monocerotis. Mag. 5.0		ν Geminorum. Mag. 4.1		δ Lyncis. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right. Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 22	° ' " -52 39	h m 6 24	° ' " - 4 42	h m 6 24	° ' " +20 15	h m 6 30	° ' " +61 32
	s	"	s	"	s	"	s	"
Jan. 0.5	16.844	23.08	10.794	59.21	24.811	33.37	42.10	53.39
10.5	16.820	26.52	10.851	60.82	24.886	33.24	42.21	55.66
20.4	16.723	29.73	10.860	62.29	24.909	33.20	42.22	57.91
30.4	16.558	32.60	10.822	63.57	24.881	33.24	42.14	60.08
Feb. 9.4	16.336	35.09	10.742	64.63	24.805	33.35	41.97	62.07
19.4	16.058	37.13	10.620	65.47	24.686	33.49	41.71	63.78
Mar. 1.3	15.741	38.71	10.468	66.08	24.532	33.64	41.39	65.19
11.3	15.393	39.77	10.294	66.46	24.355	33.79	41.02	66.19
21.3	15.030	40.28	10.106	66.60	24.163	33.91	40.62	66.77
31.2	14.664	40.29	9.918	66.53	23.968	34.01	40.21	66.91
Apr. 10.2	14.309	39.78	9.736	66.25	23.782	34.07	39.82	66.64
20.2	13.975	38.75	9.571	65.74	23.615	34.11	39.46	65.94
30.2	13.674	37.30	9.431	65.04	23.473	34.12	39.14	64.83
May 10.1	13.411	35.36	9.322	64.14	23.367	34.13	38.88	63.44
20.1	13.199	33.03	9.249	63.07	23.300	34.16	38.70	61.74
30.1	13.043	30.36	9.213	61.81	23.274	34.20	38.59	59.84
June 9.1	12.943	27.41	9.216	60.43	23.290	34.28	38.56	57.81
19.0	12.906	24.28	9.261	58.94	23.349	34.39	38.62	55.69
29.0	12.929	21.03	9.342	57.37	23.449	34.55	38.76	53.55
July 9.0	13.013	17.73	9.459	55.78	23.586	34.74	38.97	51.44
18.9	13.154	14.48	9.608	54.19	23.758	34.96	39.25	49.42
28.9	13.351	11.40	9.788	52.67	23.960	35.19	39.60	47.52
Aug. 7.9	13.598	8.55	9.992	51.27	24.187	35.41	40.00	45.82
17.9	13.889	6.05	10.217	50.05	24.437	35.60	40.45	44.30
27.8	14.219	3.99	10.462	49.05	24.705	35.73	40.94	43.01
Sept. 6.8	14.583	2.44	10.720	48.33	24.987	35.80	41.47	41.98
16.8	14.969	1.45	10.990	47.91	25.280	35.78	42.02	41.21
26.8	15.369	1.09	11.267	47.84	25.581	35.66	42.58	40.74
Oct. 6.7	15.775	1.34	11.549	48.10	25.887	35.44	43.16	40.56
16.7	16.174	2.26	11.830	48.71	26.191	35.14	43.74	40.71
26.7	16.560	3.79	12.107	49.63	26.493	34.76	44.30	41.15
Nov. 5.6	16.922	5.89	12.373	50.84	26.786	34.33	44.85	41.94
15.6	17.246	8.46	12.627	52.28	27.065	33.88	45.37	43.04
25.6	17.521	11.46	12.858	53.90	27.322	33.43	45.84	44.46
Dec. 5.6	17.745	14.75	13.063	55.64	27.552	33.02	46.25	46.15
15.5	17.904	18.23	13.232	57.41	27.747	32.67	46.60	48.09
25.5	17.994	21.76	13.363	59.17	27.900	32.42	46.86	50.21
35.5	18.016	25.24	13.449	60.83	28.006	32.26	47.03	52.46
Mean Place	14.557	11.61	9.503	48.07	23.482	43.98	39.551	63.29
Sec δ , Tan δ	1.648	-1.311	1.003	-0.082	1.066	+0.369	2.099	+1.846
$D\psi\alpha$, $D\omega\alpha$	+0.027	-0.008	+0.059	-0.001	+0.071	+0.003	+0.110	+0.016
$D\psi\delta$, $D\omega\delta$	-0.04	+1.00	-0.04	+0.99	-0.04	+0.99	-0.05	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ^2 Canis Majoris. Mag. 4.5		23 H. Camelop. Mag. 5.6		γ Geminorum. Mag. 1.9		51 Aurigæ. Mag. 5.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 31	° ' " -22 54	h m 6 33	° ' " +79 38	h m 6 33	° ' " +16 27	h m 6 33	° ' " +39 27
	s	"	s	"	s	"	s	"
Jan. 0.5	51.231	19.27	14.11	55.46	17.164	47.60	21.064	26.28
10.5	51.277 ⁴⁶ / ₆	21.83 ²⁵⁶ / ₆	14.28 ¹⁷ / ₈	58.47 ³⁰¹ / ₈	17.246 ⁸² / ₂₈	47.20 ⁴⁰ / ₂₈	21.161 ⁹⁷ / ₃₅	27.32 ¹⁰⁴ / ₁₁₀
20.4	51.271	24.19 ²³⁶ / ₅₃	14.20	61.44 ²⁹⁷ / ₂₈₂	17.274	46.94 ²⁶ / ₁₆	21.196 [—] / ₂₈	28.42 ¹¹¹ / ₁₀₅
30.4	51.218	26.31 ²¹² / ₉₉	13.87 ³³ / ₅₅	64.26 ²⁵⁶ / ₂₂₂	17.256	46.78 ⁸ / ₀	21.168	29.53 ⁹⁶ / ₇₉
Feb. 9.4	51.119	28.13 ¹⁸² / ₁₄₁	13.32 ⁷⁷ / ₉₂	66.82 ¹⁷⁶ / ₁₂₈	17.186	46.70	21.081 ⁸⁷ / ₁₄₀	30.58 ¹⁰⁵ / ₆
19.4	50.978	29.63 ¹¹³ / ₁₇₄	12.55	69.04 ¹¹¹ / ₁₈₃	17.075	46.70	20.941	31.54 ⁷⁹ / ₆₁
Mar. 1.3	50.804	30.76 ⁷⁷ / ₁₉₇	11.63 ⁹² / ₁₀₄	70.80 ¹²⁸ / ₇₂	16.932	46.74 ⁴ / ₁₀	20.758 ¹⁸³ / ₂₁₁	32.33 ⁷⁹ / ₄₁
11.3	50.607	31.53 ³⁹ / ₂₁₇	10.59 ¹⁰⁴ / ₁₁₂	72.08 ⁷² / ₁₄	16.761	46.84 ¹⁰ / ₁₃	20.544 ²¹¹ / ₂₃₃	32.94 ⁶¹ / ₁₅
21.3	50.396	31.92 ¹ / ₂₀₈	9.47 ¹¹² / ₁₁₂	72.80 ¹⁴ / ₁₁	16.574	46.94 ¹⁰ / ₁₃	20.311 ²³⁹ / ₂₃₀	33.35 ¹⁵ / ₆
31.2	50.179	31.93 ³⁵ / ₁₉₂	8.32 ¹¹⁵ / ₁₀₅	72.94	16.384	47.08	20.072	33.50
Apr. 10.2	49.971	31.58 ⁷⁰ / ₁₆₉	7.20 ¹⁰⁵ / ₉₅	72.53 ⁹⁶ / ₁₄₄	16.201	47.21 ¹² / ₁₅	19.842 ²¹¹ / ₁₇₉	33.44 ²⁸ / ₄₉
20.2	49.779	30.88 ¹⁰⁵ / ₁₃₈	6.15 ⁹⁵ / ₇₇	71.57 ¹⁴⁴ / ₁₈₉	16.034	47.33 ¹² / ₁₆	19.631 ²¹¹ / ₁₄₀	33.16 ²⁸ / ₆₆
30.2	49.610	29.83 ¹³⁷ / ₁₀₄	5.20 ⁹⁵ / ₆₁	70.13 ¹⁴⁴ / ₂₂₃	15.894	47.48 ¹⁵ / ₂₀	19.452 ²¹¹ / ₉₆	32.67 ⁴⁹ / ₇₉
May 10.1	49.472	28.46 ¹⁶⁷ / ₆₄	4.43 ⁷⁷ / ₄₂	68.24 ¹⁸⁹ / ₂₅₂	15.783	47.64 ¹⁶ / ₂₄	19.312 ¹⁴⁰ / ₄₆	32.01 ⁶⁶ / ₉₀
20.1	49.368	26.79 ¹⁹² / ₂₄	3.82 ⁶¹ / ₂₂	66.01 ²²³ / ₂₇₂	15.711	47.84 ²⁰ / ₂₉	19.216 ⁹⁶ / ₅	31.22 ⁷⁹ / ₉₆
30.1	49.304	24.87 ²¹³ / ₁₈	3.40 ²² / ₀	63.49 ²⁷² / ₂₈₁	15.678	48.08 ²⁹ / ₃₀	19.170 ⁵ / ₅₅	30.32 ⁹⁶ / ₉₉
June 9.1	49.280	22.74 ²²⁹ / ₅₉	3.18 ⁰ / ₂₂	60.77 ²⁸¹ / ₂₈₈	15.683	48.37 ²⁹ / ₃₆	19.175 ⁵ / ₁₀₇	29.36 ⁹⁶ / ₉₂
19.0	49.298	20.45 ²⁴⁰ / ₉₇	3.18 ²² / ₆₁	57.93 ²⁸¹ / ₂₇₂	15.733	48.67 ³⁰ / ₄₀	19.230 ⁵⁵ / ₁₉₂	28.37 ⁹⁹ / ₈₅
29.0	49.357	18.05 ²⁴⁴ / ₁₃₃	3.40 ²² / ₁₂₁	55.05 ²⁸⁸ / ₁₃₁	15.820	49.03 ³⁶ / ₁₀	19.337 ¹⁰⁷ / ₃₃₆	27.39 ⁹⁸ / ₅₄
July 9.0	49.454	15.61 ²⁴⁰ / ₁₆₇	3.81 ⁴¹ / ₈₀	52.20 ²⁸⁵ / ₂₅₆	15.946	49.42 ³⁹ / ₃₆	19.489 ¹⁵² / ₂₃₂	26.43 ⁹⁶ / ₈₅
18.9	49.587	13.21 ²³⁰ / ₁₉₇	4.42 ⁸⁰ / ₉₄	49.48 ²⁵⁶ / ₂₃₄	16.105	49.82 ³⁶ / ₃₇	19.681 ²³² / ₂₆₅	25.51 ⁸⁵ / ₇₈
28.9	49.754	10.91 ²¹⁴ / ₂₂₃	5.22 ⁸⁰ / ₁₁₀	46.92 ²⁵⁶ / ₂₀₇	16.291	50.18 ³⁶ / ₃₂	19.913 ²³² / ₂₉₃	24.66 ⁸⁵ / ₆₉
Aug. 7.9	49.951	8.77 ¹⁸⁶ / ₂₄₄	6.16 ⁹⁴ / ₁₂₁	44.58 ²³⁴ / ₁₇₄	16.508	50.55 ³⁷ / ₂₃	20.178 ²⁶⁵ / ₃₁₇	23.88 ⁷⁸ / ₆₂
17.9	50.174	6.91 ¹⁵⁵ / ₂₆₄	7.26 ¹¹⁰ / ₁₃₁	42.51 ²⁰⁷ / ₁₄₀	16.749	50.87 ³² / ₁₀	20.471 ²⁹³ / ₃₃₆	23.19 ⁶⁹ / ₅₄
27.8	50.418	5.36 ¹¹⁵ / ₂₇₈	8.47 ¹²¹ / ₁₃₉	40.77 ¹⁷⁴ / ₁₀₀	17.003	51.10 ²³ / ₀	20.788 ³¹⁷ / ₃₅₁	22.57 ⁶² / ₄₄
Sept. 6.8	50.682	4.21 ⁷³ / ₂₈₈	9.78 ¹³⁹ / ₁₄₃	39.37 ¹⁰⁰ / ₅₈	17.276	51.20 ²⁷³ / ₂₈₆	21.124 ³³⁶ / ₀	22.03 ⁵⁴ / ₃₅
16.8	50.960	3.48 ²⁶ / ₂₉₃	11.17 ¹³⁹ / ₁₄₆	38.37 ⁵⁸ / ₁₄₆	17.562	51.20 ²⁸⁶ / ₂₇	21.475 ³⁵¹ / ₂₉₈	21.59 ⁴⁴ / ₁₆
26.8	51.248	3.22 ²⁵ / ₂₈₉	12.60 ¹⁴³ / ₁₂₁	37.79 ⁵⁸ / ₁₄₂	17.855	51.06 ²⁹³ / ₄₉	21.837 ³⁶² / ₃₆₇	21.24 ³⁵ / ₃
Oct. 6.7	51.541	3.47 ⁷³ / ₁₆₅	14.06 ¹⁴⁶ / ₁₆₅	37.61 ¹⁸ / ₁₁₇	18.154	50.77 ²⁹⁹ / ₆₃	22.205 ³⁶⁸ / ₃₅₇	20.98 ²⁶ / ₁₂
16.7	51.835	4.20 ¹²¹ / ₂₀₀	15.52 ¹⁴⁶ / ₂₃₁	37.88 ⁷² / ₁₅₈	18.454	50.37 ³⁰⁰ / ₆₅	22.574 ³⁶⁹ / ₃₁₆	20.82 ¹⁶ / ₄₂
26.7	52.124	5.41 ¹⁶⁵ / ₂₆₂	16.94 ¹³⁶ / ₁₁₃	38.60 ¹¹⁷ / ₂₃₆	18.752	49.88 ²⁸⁹ / ₆₇	22.941 ³⁵⁷ / ₂₄₂	20.79 ¹² / ₇₄
Nov. 5.6	52.402	7.06 ²⁰⁰ / ₂₅₁	18.30 ¹²⁷ / ₉₈	39.77 ¹¹⁷ / ₇₈	19.041	49.25 ²⁸⁹ / ₆₁	23.298 ³⁴⁰ / ₁₉₂	20.91 ²⁶ / ₈₀
15.6	52.664	9.06 ²³¹ / ₂₆₆	19.57 ¹¹³ / ₅₇	41.35 ¹⁵⁸ / ₃₃	19.318	48.60 ²⁷⁷ / ₅₂	23.638 ³¹⁶ / ₁₃₆	21.17 ⁴² / ₁₀₁
25.6	52.901	11.37 ²⁵¹ / ₂₈₃	20.70 ⁹⁸ / ₃₃	43.34 ²³⁶ / ₃₀₀	19.576	47.92 ²⁵⁸ / ₁₁₁	23.954 ²⁸¹ / ₄₅	21.59 ⁵⁹ / ₈₀
Dec. 5.6	53.107	13.88 ²⁶⁵ / ₁₂₇	21.68 ⁷⁸ / ₇₇	45.70 ²⁶³ / ₃₀₀	19.807	47.25 ²³¹ / ₄₅	24.235 ²⁸¹ / ₁₃₆	22.18 ⁷⁴ / ₈₀
15.5	53.276	16.53 ²⁶⁶ / ₂₈₃	22.46 ⁵⁷ / ₃₃	48.33 ²⁸⁸ / ₃₀₀	20.007	46.64 ¹⁵⁹ / ₄₅	24.477 ¹⁹² / ₁₃₆	22.92 ⁸⁰ / ₁₀₁
25.5	53.403	19.19 ²⁶⁶ / ₂₈₃	23.03 ⁵⁷ / ₃₃	51.21 ²⁸⁸ / ₃₀₀	20.166	46.12 ¹⁵⁹ / ₄₅	24.669 ¹⁹² / ₁₃₆	23.81 ⁸⁰ / ₁₀₁
35.5	53.480	21.82 ²⁸³ / ₂₈₃	23.36 ³³ / ₃₃	54.21 ³⁰⁰ / ₃₀₀	20.277	45.67 ¹¹¹ / ₄₅	24.805 ¹³⁶ / ₁₃₆	24.82 ¹⁰¹ / ₁₀₁
Mean Place	49.780	8.23	7.316	65.07	15.865	58.47	19.491	36.80
Sec δ , Tan δ	1.086	-0.423	5.565	+5.475	1.043	+0.296	1.295	+0.823
$D\psi\alpha$, $D\omega\alpha$	+0.050	-0.004	+0.205	+0.052	+0.069	+0.003	+0.083	+0.008
$D\psi\delta$, $D\omega\delta$	-0.06	+0.99	-0.06	+0.99	-0.06	+0.99	-0.06	+0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Argus. Mag. 3.2		S Monocerotis. Mag. 4.7		ϵ Geminorum. Mag. 3.2		ξ Geminorum. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 35	° ' -43 7	h m 6 36	° ' + 9 57	h m 6 39	° ' +25 12	h m 6 40	° ' +12 58
	s	"	s	"	s	"	s	"
Jan. 0.5	26.314 20	50.78 329	45.548 80	54.40 79	13.102 90	20.56 12	59.387 86	36.59 62
10.5	26.334 42	54.07 307	45.628 31	53.61 66	13.192 40	20.68 25	59.473 36	35.97 50
20.4	26.292 102	57.14 280	45.659 19	52.95 53	13.232 13	20.93 32	59.509 14	35.47 38
30.4	26.190 155	59.94 245	45.640 64	52.42 39	13.219 69	21.25 39	59.495 62	35.09 26
Feb. 9.4	26.035 204	62.39 205	45.576 107	52.03 28	13.150 111	21.64 38	59.433 105	34.83 15
19.4	25.831 242	64.44 159	45.469 142	51.75 16	13.039 150	22.02 36	59.328 140	34.68 5
Mar. 1.3	25.589 270	66.03 111	45.327 166	51.59 6	12.889 178	22.38 34	59.188 166	34.63 2
11.3	25.319 287	67.14 63	45.161 181	51.53 2	12.711 194	22.72 24	59.022 181	34.65 6
21.3	25.032 291	67.77 15	44.980 187	51.55 10	12.517 200	22.96 20	58.841 188	34.71 13
31.3	24.741 286	67.92 35	44.793 179	51.65 18	12.317 196	23.16 8	58.653 182	34.84 16
Apr. 10.2	24.455 269	67.57 82	44.614 165	51.83 25	12.121 177	23.24 0	58.471 168	35.00 21
20.2	24.186 242	66.75 128	44.449 141	52.08 31	11.944 154	23.24 5	58.303 142	35.21 25
30.2	23.944 208	65.47 208	44.308 110	52.39 40	11.790 118	23.19 13	58.161 114	35.46 29
May 10.1	23.736 169	63.79 168	44.198 71	52.79 48	11.672 83	23.06 17	58.047 77	35.75 34
20.1	23.567 122	61.71 242	44.124 39	53.27 54	11.589 39	22.89 19	57.970 41	36.09 40
30.1	23.445 75	59.29 268	44.085 3	53.81 62	11.550 2	22.70 19	57.929 0	36.49 45
June 9.1	23.370 24	56.61 290	44.088 44	54.43 68	11.552 68	22.51 18	57.929 40	36.94 49
19.0	23.346 26	53.71 301	44.132 80	55.11 72	11.600 47	22.33 16	57.969 79	37.43 55
29.0	23.372 76	50.67 309	44.212 117	55.83 75	11.687 126	22.17 15	58.048 115	37.98 56
July 9.0	23.448 123	47.58 305	44.329 149	56.58 75	11.813 165	22.02 15	58.163 149	38.54 56
19.0	23.571 169	44.53 294	44.478 180	57.33 74	11.978 194	21.87 10	58.312 179	39.10 54
28.9	23.740 209	41.59 273	44.658 204	58.07 68	12.172 226	21.77 11	58.491 203	39.64 50
Aug. 7.9	23.949 245	38.86 210	44.862 228	58.75 56	12.398 247	21.66 12	58.694 228	40.14 42
17.9	24.194 279	36.46 203	45.090 215	59.31 46	12.645 270	21.52 14	58.922 246	40.56 32
27.8	24.473 306	34.43 155	45.335 262	59.77 30	12.915 288	21.38 19	59.168 264	40.88 17
Sept. 6.8	24.779 326	32.88 102	45.597 274	60.07 11	13.203 299	21.19 22	59.432 277	41.05 2
16.8	25.105 343	31.86 44	45.871 284	60.18 9	13.502 310	20.97 24	59.709 286	41.07 14
26.8	25.448 349	31.42 15	46.155 289	60.09 29	13.812 315	20.73 33	59.995 292	40.93 31
Oct. 6.7	25.797 349	31.57 78	46.444 292	59.80 49	14.127 319	20.40 34	60.287 296	40.62 49
16.7	26.146 340	32.35 137	46.736 289	59.31 67	14.446 318	20.06 39	60.583 291	40.13 63
26.7	26.486 325	33.72 192	47.025 283	58.64 80	14.764 314	19.67 37	60.877 289	39.50 77
Nov. 5.7	26.811 298	35.64 240	47.308 271	57.84 93	15.078 297	19.30 35	61.166 276	38.73 83
15.6	27.109 267	38.04 281	47.579 252	56.91 100	15.375 277	18.95 30	61.442 239	37.90 89
25.6	27.376 223	40.85 309	47.831 226	55.91 103	15.652 252	18.65 22	61.701 252	37.01 88
Dec. 5.6	27.599 172	43.94 329	48.057 194	54.88 101	15.904 214	18.43 12	61.933 201	36.13 86
15.5	27.771 118	47.23 337	48.251 155	53.87 93	16.118 176	18.31 1	62.134 161	35.27 77
25.5	27.889 58	50.60 333	48.406 110	52.94 86	16.294 126	18.32 9	62.295 118	34.50 67
35.5	27.947	53.93	48.516	52.08	16.420	18.41	62.413	33.83
Mean Place	24.403	40.15	44.273	65.35	11.746	31.47	58.106	47.58
Sec δ , Tan δ	1.370	-0.937	1.015	+0.176	1.105	+0.471	1.026	+0.230
$D\psi\alpha$, $D\omega\alpha$	+0.037	-0.010	+0.066	+0.002	+0.073	+0.005	+0.067	+0.003
$D\psi\delta$, $D\omega\delta$	-0.06	+0.99	-0.06	+0.99	-0.07	+0.99	-0.07	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ^5 Aurigæ. Mag. 5.3			α Canis Majoris. (Sirius.) Mag. -1.6			18 Monocerotis. Mag. 4.7			43 Camelop. Mag. 5.1		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 6 41	s	° ' " +43 39	h m 6 41	s	° ' " -16 36	h m 6 43	s	° ' " + 2 29	h m 6 45	s	° ' " +68 58
Jan. 0.5	13.252	110	9.41	46.547	55	46.60	52.003	81	40.39	28.04	17	38.00
10.5	13.362	44	10.69	46.602	8	48.92	52.084	33	39.14	28.21	4	40.60
20.4	13.406	22	12.04	46.610	39	51.07	52.117	15	38.01	28.25	10	43.19
30.4	13.384	86	13.39	46.571	84	53.00	52.102	62	37.07	28.15	22	45.72
Feb. 9.4	13.298	144	14.67	46.487	128	54.64	52.040	105	36.28	27.93	32	48.08
19.4	13.154	189	15.84	46.359	160	55.98	51.935	138	35.70	27.61	42	50.15
Mar. 1.3	12.965	227	16.84	46.199	185	57.00	51.797	163	35.28	27.19	48	51.87
11.3	12.738	218	17.61	46.014	198	57.71	51.634	185	35.02	26.71	53	53.16
21.3	12.490	255	18.14	45.816	203	58.09	51.455	179	34.94	26.18	55	54.00
31.3	12.235	251	18.39	45.613	197	58.12	51.270	180	35.00	25.63	55	54.33
Apr. 10.2	11.984	229	18.38	45.416	182	57.86	51.090	167	35.22	25.08	51	54.18
20.2	11.755	199	18.08	45.234	159	57.26	50.923	112	35.57	24.57	45	53.54
30.2	11.556	159	17.56	45.075	129	56.37	50.781	83	36.07	24.12	39	52.46
May 10.1	11.397	112	16.80	44.946	95	55.21	50.666	83	36.70	23.73	29	50.98
20.1	11.285	61	15.88	44.851	62	53.80	50.583	44	37.46	23.44	19	49.17
30.1	11.224	7	14.83	44.789	21	52.16	50.539	7	38.34	23.25	10	47.07
June 9.1	11.217	49	13.66	44.768	20	50.33	50.532	31	39.32	23.15	1	44.79
19.0	11.266	99	12.45	44.788	59	48.36	50.563	68	40.38	23.16	12	42.37
29.0	11.365	119	11.23	44.847	95	46.31	50.631	106	41.50	23.28	23	39.90
July 9.0	11.514	195	10.02	44.942	129	44.21	50.737	137	42.65	23.51	31	37.43
19.0	11.709	234	8.85	45.071	162	42.13	50.874	167	43.80	23.82	41	35.02
28.9	11.943	272	7.75	45.233	190	40.16	51.041	193	44.91	24.21	48	32.73
Aug. 7.9	12.215	301	6.72	45.423	216	38.33	51.234	215	45.93	24.71	55	30.63
17.9	12.519	329	5.78	45.639	238	36.73	51.449	236	46.83	25.26	62	28.72
27.8	12.848	352	4.95	45.877	254	35.43	51.685	251	47.53	25.88	68	27.07
Sept. 6.8	13.200	368	4.24	46.131	268	34.47	51.936	267	48.02	26.54	70	25.70
16.8	13.568	381	3.63	46.399	278	33.90	52.203	273	48.28	27.24	75	24.64
26.8	13.949	391	3.16	46.677	285	33.74	52.478	284	48.26	27.99	75	23.92
Oct. 6.7	14.340	394	2.82	46.962	289	34.04	52.762	285	47.97	28.74	75	23.54
16.7	14.734	391	2.64	47.251	284	34.79	53.047	286	47.40	29.49	75	23.53
26.7	15.125	383	2.61	47.535	274	35.97	53.333	279	46.58	30.24	72	23.92
Nov. 5.7	15.508	367	2.79	47.809	260	37.51	53.612	268	45.54	30.96	68	24.69
15.6	15.875	340	3.13	48.069	239	39.40	53.880	249	44.31	31.64	63	25.84
25.6	16.215	307	3.68	48.308	209	41.55	54.129	228	42.95	32.27	56	27.36
Dec. 5.6	16.522	264	4.43	48.517	174	43.89	54.357	193	41.53	32.83	47	29.22
15.5	16.786	211	5.36	48.691	135	46.33	54.550	155	40.09	33.30	36	31.39
25.5	16.997	152	6.48	48.826	88	48.77	54.705	111	38.68	33.66	24	33.78
35.5	17.149	125	7.73	48.914	51	51.16	54.816	73	37.36	33.90	24	36.34
Mean Place	11.597		20.27	45.294		34.35	50.731		51.32	24.765		48.78
Sec δ , Tan δ	1.382		+0.954	1.044		-0.298	1.001		+0.044	2.787		+2.602
$D\psi\alpha$, $D\omega\alpha$	+0.086		+0.011	+0.053		-0.004	+0.062		+0.001	+0.129		+0.034
$D\psi\delta$, $D\omega\delta$	-0.07		+0.98	-0.07		+0.98	-0.08		+0.98	-0.08		+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Pictoris. Mag. 3.3		θ Geminorum. Mag. 3.6		τ Argus. Mag. 2.8		θ Canis Majoris. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 47	° ' -61 51	h m 6 47	° ' +34 3	h m 6 48	° ' -50 31	h m 6 50	° ' -11 56
	s	"	s	"	s	"	s	"
Jan. 0.5	27.30	40.39	44.437	8.77	3.776	31.46	38.120	38.08
10.5	27.28	44.01	44.544	9.46	3.798	34.95	38.196	40.17
20.5	27.17	47.46	44.595	10.24	3.749	38.27	38.223	42.10
30.4	26.97	50.65	44.589	11.08	3.632	41.32	38.201	43.82
Feb. 9.4	26.69	53.48	44.522	11.90	3.453	44.03	38.131	45.31
19.4	26.35	55.91	44.407	12.71	3.219	46.33	38.021	46.51
Mar. 1.3	25.94	57.86	44.248	13.42	2.941	48.18	37.877	47.43
11.3	25.50	59.32	44.059	14.02	2.627	49.54	37.706	48.06
21.3	25.02	60.26	43.846	14.44	2.294	50.40	37.518	48.41
31.3	24.54	60.65	43.627	14.69	1.951	50.75	37.324	48.47
Apr. 10.2	24.06	60.50	43.412	14.79	1.612	50.58	37.133	48.25
20.2	23.60	59.83	43.215	14.70	1.288	49.90	36.955	47.75
30.2	23.17	58.64	43.043	14.47	0.991	48.74	36.797	47.00
May 10.2	22.78	57.00	42.903	14.07	0.728	47.13	36.668	45.99
20.1	22.45	54.89	42.806	13.56	0.508	45.09	36.570	44.75
30.1	22.18	52.40	42.752	12.95	0.335	42.70	36.507	43.32
June 9.1	21.98	49.59	42.745	12.32	0.216	39.98	36.482	41.71
19.0	21.85	46.51	42.784	11.63	0.151	37.01	36.497	39.94
29.0	21.79	43.26	42.867	10.93	0.144	33.89	36.548	38.10
July 9.0	21.82	39.91	42.996	10.22	0.193	30.67	36.636	36.20
19.0	21.92	36.57	43.164	9.53	0.298	27.47	36.757	34.32
28.9	22.09	33.31	43.365	8.89	0.455	24.37	36.909	32.51
Aug. 7.9	22.34	30.26	43.602	8.29	0.663	21.46	37.091	30.83
17.9	22.65	27.51	43.865	7.71	0.917	18.85	37.295	29.35
27.9	23.02	25.17	44.151	7.15	1.211	16.63	37.523	28.12
Sept. 6.8	23.44	23.29	44.460	6.66	1.540	14.87	37.769	27.19
16.8	23.90	21.98	44.783	6.16	1.897	13.66	38.029	26.63
26.8	24.38	21.28	45.116	5.73	2.274	13.05	38.304	26.44
Oct. 6.7	24.89	21.21	45.461	5.33	2.663	13.07	38.585	26.67
16.7	25.39	21.82	45.810	4.97	3.055	13.72	38.872	27.30
26.7	25.88	23.09	46.157	4.65	3.440	14.99	39.156	28.32
Nov. 5.7	26.35	24.96	46.501	4.49	3.809	16.87	39.436	29.69
15.6	26.77	27.39	46.828	4.40	4.148	19.26	39.703	31.39
25.6	27.14	30.28	47.136	4.47	4.449	22.09	39.952	33.31
Dec. 5.6	27.44	33.53	47.416	4.67	4.703	25.23	40.175	35.42
15.6	27.65	37.04	47.659	5.01	4.900	28.68	40.365	37.60
25.5	27.78	40.68	47.854	5.50	5.032	32.21	40.517	39.80
35.5	27.82	44.32	48.001	6.13	5.097	35.73	40.621	41.94
Mean Place	24.180	31.16	42.992	19.96	1.514	21.94	36.775	27.56
Sec δ , Tan δ	2.120	-1.870	1.207	+0.676	1.573	-1.214	1.022	-0.212
$D\psi\alpha$, $D\omega\alpha$	+0.013	-0.026	+0.079	+0.009	+0.030	-0.017	+0.056	-0.003
$D\psi\delta$, $D\omega\delta$	-0.08	+0.98	-0.08	+0.98	-0.08	+0.98	-0.09	+0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Lyncis. Mag. 4.5		ε Canis Majoris. Mag. 1.6		ζ Geminorum. Var. 3.7-4.3		o ² Canis Majoris. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 6 50	° ' " +58 31	h m 6 55	° ' " -28 51	h m 6 59	° ' " +20 40	h m 6 59	° ' " -23 43
	s	"	s	"	s	"	s	"
Jan. 0.5	39.269 ¹⁴⁴	20.89 ²⁰⁸	37.533 ⁶⁵	68.65 ²⁸⁸	33.901 ¹⁰⁸	52.84 ¹⁷	50.035 ⁷⁶	20.97 ²⁶⁹
10.5	39.413 ⁵⁷	22.97 ²¹³	37.598 ¹²	71.53 ²⁷⁵	34.009 ⁵⁹	52.67 ⁵	50.111 ²⁴	23.66 ²⁵²
20.5	39.470 ³⁷	25.10 ²¹²	37.610 ⁴²	74.28 ²¹⁸	34.068 ⁴	52.62 ⁷	50.135 ²⁸	26.18 ²³⁰
30.4	39.433 ¹²²	27.22 ¹⁹⁸	37.568 ⁸⁸	76.76 ²¹⁹	34.072 ⁴⁵	52.69 ¹⁵	50.107 ⁷⁷	28.48 ²⁰²
Feb. 9.4	39.311 ²⁰²	29.20 ¹⁷⁷	37.480 ¹³⁷	78.95 ¹⁸⁵	34.027 ⁹³	52.84 ²³	50.030 ¹²¹	30.50 ¹⁶⁹
19.4	39.109 ²⁶⁷	30.97 ¹⁵¹	37.343 ¹⁷⁵	80.80 ¹⁴⁶	33.934 ¹³¹	53.07 ²⁶	49.909 ¹⁵⁹	32.19 ¹³⁵
Mar. 1.3	38.842 ³¹⁹	32.48 ¹¹⁷	37.168 ²⁰¹	82.26 ¹⁰⁶	33.803 ¹⁶²	53.33 ²⁸	49.750 ¹⁸⁶	33.54 ⁹⁹
11.3	38.523 ³⁵⁰	33.65 ⁷⁹	36.967 ²¹⁹	83.32 ⁶⁸	33.641 ¹⁸³	53.61 ²⁶	49.564 ²⁰⁴	34.53 ⁶⁰
21.3	38.173 ³⁶⁵	34.44 ³⁸	36.748 ²²⁵	84.00 ²⁴	33.458 ¹⁹²	53.87 ²³	49.360 ²¹⁴	35.13 ²³
31.3	37.808 ³⁶⁰	34.82 ³	36.523 ²²⁷	84.24 ¹⁷	33.266 ¹⁸⁶	54.10 ¹⁹	49.146 ²¹¹	35.36 ¹⁵
Apr. 10.2	37.448 ³³⁸	34.79 ⁴⁴	36.296 ²¹⁴	84.07 ⁵⁵	33.080 ¹⁷⁸	54.29 ¹⁹	48.935 ²⁰¹	35.21 ⁵⁰
20.2	37.110 ²⁹⁹	34.35 ⁸⁰	36.082 ¹⁹¹	83.52 ⁹⁵	32.902 ¹⁵⁶	54.48 ¹¹	48.734 ¹⁸¹	34.71 ⁸⁷
30.2	36.811 ²⁴⁹	33.55 ¹¹⁵	35.891 ¹⁶⁶	82.57 ¹³⁴	32.746 ¹²⁶	54.59 ⁸	48.553 ¹⁵³	33.84 ¹¹⁹
May 10.2	36.562 ¹⁸⁸	32.40 ¹⁴²	35.725 ¹³⁰	81.23 ¹⁶²	32.620 ⁹⁵	54.67 ⁶	48.400 ¹²²	32.65 ¹⁵¹
20.1	36.374 ¹²⁰	30.98 ¹⁶⁸	35.595 ⁹⁸	79.61 ¹⁹⁵	32.525 ⁵¹	54.73 ⁴	48.278 ⁸⁷	31.14 ¹⁷⁸
30.1	36.254 ⁴⁹	29.30 ¹⁸⁴	35.497 ⁵⁵	77.66 ²²¹	32.471 ¹²	54.77 ⁶	48.191 ⁴⁹	29.36 ²⁰¹
June 9.1	36.205 ²⁵	27.46 ¹⁹⁷	35.442 ¹²	75.45 ²⁴¹	32.459 ²⁴	54.83 ⁶	48.142 ⁸	27.35 ²²⁰
19.0	36.230 ⁹⁵	25.49 ²⁰¹	35.430 ²⁵	73.04 ²⁵³	32.483 ⁶⁴	54.89 ⁵	48.134 ³¹	25.15 ²³²
29.0	36.325 ¹⁶⁶	23.48 ²⁰³	35.455 ⁶⁹	70.51 ²⁵⁹	32.547 ¹⁰⁵	54.94 ⁶	48.165 ⁶⁹	22.83 ²⁴⁰
July 9.0	36.491 ²³⁰	21.45 ¹⁹⁸	35.524 ¹⁰⁶	67.92 ²⁶⁰	32.652 ¹³⁸	55.00 ⁷	48.234 ¹⁰⁶	20.43 ²⁴⁰
19.0	36.721 ²⁹²	19.47 ¹⁸⁹	35.630 ¹⁴³	65.32 ²⁵²	32.790 ¹⁷¹	55.07 ⁵	48.340 ¹³⁹	18.03 ²³²
28.9	37.013 ³⁴⁴	17.58 ¹⁷⁸	35.773 ¹⁷⁹	62.80 ²³⁵	32.961 ¹⁹⁷	55.12 ²	48.479 ¹⁷²	15.71 ²¹⁶
Aug. 7.9	37.357 ³⁹⁰	15.80 ¹⁶¹	35.952 ²⁰³	60.45 ²¹⁴	33.158 ²²⁷	55.14 ⁴	48.651 ²⁰¹	13.55 ¹⁹⁶
17.9	37.747 ⁴³¹	14.19 ¹⁴³	36.155 ²³⁶	58.31 ¹⁷⁸	33.385 ²⁴⁴	55.10 ⁸	48.852 ²²⁵	11.59 ¹⁶³
27.9	38.178 ⁴⁶⁵	12.76 ¹²²	36.391 ²⁵⁸	56.53 ¹⁴⁰	33.629 ²⁶⁶	55.02 ¹⁷	49.077 ²⁴⁹	9.96 ¹²⁸
Sept. 6.8	38.643 ⁴⁹³	11.54 ⁹⁸	36.649 ²⁷⁸	55.13 ⁹²	33.895 ²⁸⁰	54.85 ²³	49.326 ²⁶⁷	8.68 ⁸⁵
16.8	39.136 ⁵¹⁴	10.56 ⁷⁴	36.927 ²⁹³	54.21 ⁴⁴	34.175 ²⁹⁶	54.62 ³⁷	49.593 ²⁸¹	7.83 ³⁹
26.8	39.650 ⁵²⁷	9.82 ⁴⁶	37.220 ³⁰³	53.77 ⁸	34.471 ³⁰⁴	54.25 ⁴³	49.874 ²⁹³	7.44 ¹¹
Oct. 6.7	40.177 ⁵³³	9.36 ¹⁹	37.523 ³⁰⁷	53.85 ⁶²	34.775 ³¹¹	53.82 ⁵⁶	50.167 ²⁹⁷	7.55 ⁶¹
16.7	40.710 ⁵³⁰	9.17 ¹³	37.830 ³⁰⁶	54.47 ¹¹⁷	35.086 ³¹²	53.26 ⁵⁹	50.464 ²⁹⁹	8.16 ¹¹⁰
26.7	41.240 ⁵¹⁹	9.30 ⁴³	38.136 ²⁹⁸	55.64 ¹⁶³	35.398 ³⁰⁹	52.67 ⁶⁶	50.763 ²⁹³	9.26 ¹⁵⁵
Nov. 5.7	41.759 ⁴⁹⁶	9.73 ⁷⁶	38.434 ²⁸³	57.27 ²⁰⁵	35.707 ³⁰⁰	52.01 ⁶⁶	51.056 ²⁸⁰	10.81 ¹⁹⁶
15.6	42.255 ⁴⁶¹	10.49 ¹⁰⁷	38.717 ²⁶²	59.32 ²⁴³	36.007 ²⁸³	51.35 ⁶³	51.336 ²⁵⁸	12.77 ²²⁸
25.6	42.716 ⁴¹⁴	11.56 ¹⁶⁴	38.979 ¹⁹¹	61.75 ²⁷⁰	36.290 ²²⁶	50.72 ⁴⁸	51.594 ¹⁹⁵	15.05 ²⁵⁴
Dec. 5.6	43.130 ³⁵⁴	12.92 ¹⁸⁷	39.208 ¹⁵⁰	64.45 ²⁸⁷	36.549 ¹⁹⁰	50.14 ³⁷	51.827 ¹⁵⁵	17.59 ²⁷⁵
15.6	43.484 ²⁸⁴	14.56 ²⁰³	39.399 ⁹⁷	67.32 ²⁹²	36.775 ¹⁴⁴	49.66 ²⁵	52.022 ¹⁰⁸	20.27 ²⁷²
25.5	43.768 ²⁰¹	16.43 ¹⁸⁷	39.549 ¹⁵⁰	70.29 ²⁹⁷	36.965 ¹⁹⁰	49.29 ³⁷	52.177 ¹⁵⁵	23.02 ²⁷⁵
35.5	43.969 ²⁰¹	18.46 ²⁰³	39.646 ⁹⁷	73.21 ²⁹²	37.109 ¹⁴⁴	49.04 ²⁵	52.285 ¹⁰⁸	25.74 ²⁷²
Mean Place	37.037	32.15	35.962	58.91	32.610	64.20	48.550	11.23
Sec δ, Tan δ	1.915	+1.633	1.142	-0.551	1.069	+0.377	1.092	-0.439
Dψα, Dωα	+0.103	+0.024	+0.047	-0.009	+0.071	+0.006	+0.050	-0.008
Dψδ, Dωδ	-0.09	+0.98	-0.10	+0.97	-0.10	+0.97	-0.10	+0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Canis Majoris. Mag. 4.1		δ Canis Majoris. Mag. 2.0		63 Aurigæ. Mag. 5.1		51 Geminorum. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 0	° ' -15 31	h m 7 5	° ' -26 16	h m 7 6	° ' +39 26	h m 7 8	° ' +16 17
	s	"	s	"	s	"	s	"
Jan. 0.5	17.888 ⁸³	16.62 ²²⁹	17.092 ⁷⁷	21.40 ²⁸²	23.269 ¹³⁷	39.45 ⁹⁷	58.360 ¹¹⁷	15.84 ⁵⁰
10.5	17.971 ³³	18.91 ²¹⁵	17.169 ²⁷	24.22 ²⁶⁶	23.406 ⁷³	40.42 ¹⁰⁷	58.477 ⁶⁶	15.34 ³⁵
20.5	18.004 ¹⁶	21.06 ¹⁹⁴	17.196 ²⁹	26.88 ²¹³	23.479 ¹²	41.49 ¹¹⁵	58.543 ¹³	14.99 ¹⁹
30.4	17.988 ⁶⁴	23.00 ¹⁶⁸	17.167 ⁷⁵	29.31 ¹⁸²	23.491 ⁵¹	42.64 ¹¹⁴	58.556 ³⁷	14.80 ⁸
Feb. 9.4	17.924 ¹⁰⁸	24.68 ¹⁴⁰	17.092 ¹²²	31.48 ¹⁰⁸	23.440 ¹⁰⁸	43.80 ¹¹⁴	58.519 ⁸³	14.72 ²
19.4	17.816 ¹⁴³	26.08 ¹⁰⁸	16.970 ¹⁶⁰	33.30 ¹⁴⁶	23.332 ¹⁵⁸	44.94 ¹⁰⁰	58.436 ¹²³	14.74 ¹¹
Mar. 1.4	17.673 ¹⁷²	27.16 ⁷⁸	16.810 ¹⁹⁰	34.76 ¹⁰⁸	23.174 ¹⁹³	45.94 ⁸⁴	58.313 ¹⁵⁴	14.85 ¹⁷
11.3	17.501 ¹⁸⁸	27.94 ⁴⁵	16.620 ²⁰⁸	35.84 ⁶⁹	22.981 ²²⁰	46.78 ⁶⁷	58.159 ¹⁷⁵	15.02 ²¹
21.3	17.313 ¹⁹⁸	28.39 ¹⁴	16.412 ²¹⁸	36.53 ³¹	22.761 ²³¹	47.45 ⁴⁴	57.984 ¹⁸⁵	15.23 ²²
31.3	17.115 ¹⁹⁵	28.53 ¹⁷	16.194 ²¹⁷	36.84 ¹⁰	22.527 ²³³	47.89 ²¹	57.799 ¹⁸⁵	15.45 ²³
Apr. 10.2	16.920 ¹⁸⁵	28.36 ⁴⁶	15.977 ²⁰⁸	36.74 ⁴⁸	22.294 ²²⁰	48.10 ³	57.614 ¹⁷⁵	15.68 ²²
20.2	16.735 ¹⁶⁴	27.90 ⁷⁷	15.769 ¹⁸⁹	36.26 ⁸⁴	22.074 ¹⁹⁴	48.07 ²²	57.439 ¹⁵⁴	15.90 ²³
30.2	16.571 ¹³⁹	27.13 ¹⁰⁴	15.580 ¹⁶¹	35.42 ¹²²	21.880 ¹⁶³	47.85 ⁴⁴	57.285 ¹²⁷	16.13 ²⁴
May 10.2	16.432 ¹⁰⁸	26.09 ¹³⁰	15.419 ¹³⁰	34.20 ¹⁵¹	21.717 ¹²²	47.41 ⁶³	57.158 ⁹⁶	16.37 ²⁴
20.1	16.324 ⁷⁴	24.79 ¹⁵²	15.289 ⁹⁹	32.69 ¹⁸²	21.595 ⁷⁷	46.78 ⁸⁰	57.062 ⁶⁰	16.61 ²⁴
30.1	16.250 ³⁷	23.27 ¹⁷²	15.190 ⁵⁸	30.87 ²⁰⁶	21.518 ³²	45.98 ⁸⁶	57.002 ²²	16.85 ²⁸
June 9.1	16.213 ²	21.55 ¹⁸⁸	15.132 ¹⁷	28.81 ²²⁷	21.486 ¹⁷	45.12 ⁹⁹	56.980 ¹⁸	17.13 ²⁸
19.1	16.215 ⁴⁰	19.67 ¹⁹⁷	15.115 ²¹	26.54 ²⁴¹	21.503 ⁶⁸	44.13 ¹⁰²	56.998 ⁵⁵	17.41 ³⁰
29.0	16.255 ⁷⁶	17.70 ²⁰¹	15.136 ⁶¹	24.13 ²¹⁸	21.571 ¹¹²	43.11 ¹⁰⁵	57.053 ⁹²	17.71 ³⁰
July 9.0	16.331 ¹¹⁰	15.66 ²⁰³	15.197 ¹⁰⁰	21.65 ²⁴⁸	21.683 ¹⁵⁴	42.06 ¹⁰⁴	57.145 ¹²⁵	18.01 ²⁹
19.0	16.441 ¹⁴³	13.63 ¹⁹⁷	15.297 ¹³²	19.17 ²⁴¹	21.837 ¹⁹⁴	41.02 ¹⁰³	57.270 ¹⁵⁷	18.30 ²⁶
28.9	16.584 ¹⁷¹	11.66 ¹⁸³	15.429 ¹⁶⁸	16.76 ²²⁶	22.031 ²³²	39.99 ¹⁰⁰	57.427 ¹⁸⁵	18.56 ²¹
Aug. 7.9	16.755 ¹⁹⁸	9.83 ¹⁶¹	15.597 ¹⁹⁵	14.50 ²⁰⁶	22.263 ²⁶³	38.99 ⁹⁶	57.612 ²¹⁰	18.77 ¹⁶
17.9	16.953 ²²¹	8.19 ¹³⁶	15.792 ²²⁶	12.44 ¹⁷²	22.526 ²⁹¹	38.03 ⁸⁸	57.822 ²³²	18.93 ⁵
27.9	17.174 ²¹³	6.83 ¹⁰⁴	16.018 ²¹⁸	10.72 ¹³⁶	22.817 ³¹¹	37.15 ⁸⁹	58.054 ²⁵³	18.98 ⁶
Sept. 6.8	17.417 ²⁵⁹	5.79 ⁶⁷	16.266 ²⁶⁸	9.36 ⁹³	23.131 ³³⁷	36.26 ⁸⁰	58.307 ²⁶⁹	18.92 ²⁰
16.8	17.676 ²⁷³	5.12 ²⁵	16.534 ²⁸⁵	8.43 ⁴⁶	23.468 ³⁵⁰	35.46 ⁶⁹	58.576 ²⁸³	18.72 ³³
26.8	17.949 ²⁸¹	4.87 ¹⁷	16.819 ²⁹⁸	7.97 ³	23.818 ³⁶⁶	34.77 ⁶²	58.859 ²⁹¹	18.39 ⁴⁷
Oct. 6.8	18.233 ²⁸⁹	5.04 ⁶³	17.117 ³⁰²	8.00 ⁶⁰	24.184 ³⁷²	34.15 ⁵¹	59.153 ³⁰²	17.92 ⁶¹
16.7	18.522 ²⁹⁰	5.67 ¹⁰³	17.419 ³⁰⁴	8.60 ¹¹⁰	24.556 ³⁷⁵	33.64 ³⁸	59.455 ³⁰⁵	17.31 ⁷⁴
26.7	18.812 ²⁸⁶	6.70 ¹⁴²	17.723 ²⁹⁸	9.70 ¹⁵⁶	24.931 ³⁷²	33.26 ²⁵	59.760 ³⁰⁴	16.57 ⁸¹
Nov. 5.7	19.098 ²⁷³	8.12 ¹⁷⁸	18.021 ²⁸⁴	11.26 ¹⁹⁸	25.303 ³⁶²	33.01 ⁶	60.064 ²⁹⁶	15.76 ⁸⁷
15.6	19.371 ²⁵⁶	9.90 ²⁰⁴	18.305 ²⁶⁵	13.24 ²³⁴	25.665 ³⁴²	32.95 ¹⁵	60.360 ²⁸²	14.89 ⁸⁸
25.6	19.627 ²³¹	11.94 ²²⁵	18.570 ²³⁹	15.58 ²⁵⁹	26.007 ³¹⁷	33.10 ³¹	60.642 ²⁵⁹	14.01 ⁸⁵
Dec. 5.6	19.858 ¹⁹⁸	14.19 ²³⁶	18.809 ²⁰¹	18.17 ²⁷⁹	26.324 ²⁷⁴	33.41 ⁵²	60.901 ²³¹	13.16 ⁷⁹
15.6	20.056 ¹⁵⁹	16.55 ²³⁹	19.010 ¹⁶⁰	20.96 ²⁸⁵	26.598 ²³⁰	33.93 ⁷¹	61.132 ¹⁹²	12.37 ⁶⁷
25.5	20.215 ¹¹³	18.94 ²³⁵	19.170 ¹¹⁰	23.81 ²⁸³	26.828 ¹⁷⁷	34.64 ⁹⁰	61.324 ¹⁴⁶	11.70 ⁵⁵
35.5	20.328	21.29	19.280	26.64	27.005	35.54	61.470	11.15
Mean Place	16.508	6.54	15.560	12.08	21.783	51.44	57.104	27.18
Sec δ , Tan δ	1.038	-0.278	1.115	-0.494	1.295	+0.823	1.042	+0.292
$D\psi\alpha$, $D\omega\alpha$	+0.054	-0.005	+0.049	-0.009	+0.082	+0.016	+0.069	+0.006
$D\psi\delta$, $D\omega\delta$	-0.10	+0.97	-0.11	+0.96	-0.11	+0.96	-0.12	+0.96

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^2 Volantis. Mag. 3.9		λ Geminorum. Mag. 3.6		π Argus. Mag. 2.7		δ Geminorum. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 9	° ' -70 22	h m 7 13	° ' +16 40	h m 7 14	° ' -36 57	h m 7 15	° ' +22 7
	s	"	s	"	s	"	s	"
Jan. 0.5	28.83	33.97	41.420	38.22	27.174	39.49	32.869	19.74
10.5	28.82	37.68	41.542	37.73	27.253	42.73	32.997	19.61
20.5	28.69	41.27	41.612	37.40	27.273	45.82	33.072	19.63
30.4	28.43	44.67	41.631	37.22	27.235	48.68	33.094	19.76
Feb. 9.4	28.05	47.76	41.598	37.16	27.144	51.28	33.063	19.99
19.4	27.58	50.48	41.518	37.21	27.002	53.51	32.984	20.29
Mar. 1.4	27.03	52.77	41.397	37.35	26.817	55.35	32.862	20.67
11.3	26.41	54.59	41.246	37.53	26.600	56.76	32.707	21.05
21.3	25.75	55.90	41.072	37.77	26.360	57.74	32.528	21.40
31.3	25.06	56.68	40.888	38.00	26.108	58.25	32.337	21.74
Apr. 10.3	24.37	56.93	40.703	38.24	25.855	58.31	32.148	21.99
20.2	23.69	56.64	40.528	38.49	25.611	57.92	31.968	22.19
30.2	23.04	55.83	40.372	38.73	25.385	57.10	31.805	22.37
May 10.2	22.44	54.52	40.242	38.97	25.184	55.85	31.669	22.46
20.1	21.90	52.73	40.143	39.20	25.013	54.23	31.566	22.50
30.1	21.43	50.52	40.080	39.44	24.883	52.25	31.500	22.50
June 9.1	21.06	47.93	40.054	39.69	24.791	49.96	31.472	22.48
19.1	20.79	45.03	40.066	39.94	24.742	47.44	31.483	22.44
29.0	20.61	41.89	40.117	40.21	24.737	44.73	31.535	22.40
July 9.0	20.53	38.61	40.205	40.47	24.775	41.91	31.623	22.35
19.0	20.57	35.27	40.325	40.72	24.856	39.08	31.746	22.27
29.0	20.72	31.97	40.479	40.95	24.977	36.30	31.903	22.17
Aug. 7.9	20.97	28.81	40.659	41.12	25.139	33.64	32.087	22.05
17.9	21.32	25.90	40.866	41.22	25.336	31.25	32.302	21.86
27.9	21.76	23.34	41.096	41.22	25.565	29.16	32.540	21.62
Sept. 6.8	22.29	21.21	41.346	41.12	25.824	27.48	32.797	21.30
16.8	22.88	19.60	41.614	40.90	26.110	26.28	33.073	20.91
26.8	23.51	18.59	41.896	40.53	26.416	25.59	33.366	20.41
Oct. 6.8	24.20	18.22	42.190	40.02	26.735	25.48	33.671	19.84
16.7	24.90	18.51	42.492	39.38	27.065	25.95	33.984	19.22
26.7	25.57	19.47	42.799	38.63	27.396	26.99	34.301	18.51
Nov. 5.7	26.22	21.06	43.104	37.81	27.721	28.58	34.619	17.79
15.7	26.82	23.23	43.403	36.94	28.032	30.67	34.928	17.05
25.6	27.34	25.92	43.689	36.05	28.321	33.17	35.225	16.39
Dec. 5.6	27.77	29.04	43.953	35.18	28.577	36.03	35.497	15.79
15.6	28.08	32.47	44.186	34.40	28.793	39.12	35.742	15.30
25.5	28.27	36.08	44.383	33.72	28.960	42.34	35.947	14.96
35.5	28.35	39.75	44.536	33.17	29.075	45.57	36.109	14.73
Mean Place	24.263	27.11	40.171	49.62	25.394	31.33	31.602	31.43
Sec δ , Tan δ	2.978	-2.805	1.044	+0.300	1.252	-0.752	1.079	+0.406
$D\psi\alpha$, $D\omega\alpha$	-0.010	-0.056	+0.069	+0.006	+0.042	-0.016	+0.071	+0.009
$D\psi\delta$, $D\omega\delta$	-0.12	+0.95	-0.13	+0.95	-0.13	+0.95	-0.13	+0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Volantis. Mag. 4.0		ϵ Geminorum. Mag. 3.9		η Canis Majoris. Mag. 2.4		Groombridge 1308. Mag. 5.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 16	° ' -67 48	h m 7 20	° ' +27 56	h m 7 21	° ' -29 9	h m 7 22	° ' +68 37
	s	"	s	"	s	"	s	"
Jan. 0.5	56.91	65.21	58.113	56.68	4.605	15.44	56.04	16.87
10.5	56.94	68.95	58.252	56.89	4.698	18.40	56.30	19.36
20.5	56.84	72.59	58.337	57.25	4.738	21.24	56.43	21.95
30.4	56.64	76.02	58.365	57.74	4.724	23.85	56.43	24.56
Feb. 9.4	56.34	79.19	58.338	58.31	4.657	26.21	56.31	27.07
19.4	55.94	81.99	58.259	58.93	4.542	28.23	56.06	29.43
Mar. 1.4	55.47	84.37	58.134	59.56	4.387	29.90	55.72	31.51
11.3	54.94	86.28	57.975	60.14	4.200	31.17	55.30	33.20
21.3	54.36	87.69	57.789	60.66	3.990	32.05	54.81	34.46
31.3	53.76	88.56	57.591	61.08	3.768	32.51	54.29	35.27
Apr. 10.3	53.15	88.91	57.390	61.40	3.545	32.58	53.76	35.60
20.2	52.55	88.72	57.200	61.58	3.329	32.24	53.24	35.44
30.2	51.98	87.99	57.028	61.65	3.129	31.50	52.76	34.80
May 10.2	51.45	86.75	56.882	61.60	2.953	30.38	52.33	33.70
20.1	50.97	85.05	56.769	61.45	2.805	28.93	51.98	32.23
30.1	50.56	82.91	56.695	61.24	2.692	27.16	51.71	30.40
June 9.1	50.23	80.38	56.661	60.94	2.617	25.11	51.53	28.32
19.1	49.98	77.53	56.667	60.59	2.580	22.84	51.46	26.00
29.0	49.82	74.43	56.715	60.20	2.582	20.41	51.48	23.54
July 9.0	49.75	71.18	56.801	59.77	2.624	17.88	51.60	21.01
19.0	49.78	67.86	56.926	59.34	2.704	15.31	51.82	18.46
29.0	49.90	64.55	57.086	58.88	2.822	12.79	52.13	15.95
Aug. 7.9	50.12	61.38	57.275	58.40	2.974	10.41	52.52	13.54
17.9	50.42	58.45	57.494	57.90	3.157	8.24	52.99	11.28
27.9	50.81	55.83	57.738	57.37	3.371	6.36	53.53	9.17
Sept. 6.8	51.27	53.66	58.005	56.79	3.612	4.86	54.12	7.32
16.8	51.80	51.99	58.291	56.18	3.876	3.78	54.77	5.73
26.8	52.37	50.91	58.595	55.54	4.159	3.20	55.47	4.45
Oct. 6.8	52.98	50.47	58.910	54.87	4.457	3.13	56.19	3.49
16.7	53.60	50.68	59.238	54.17	4.766	3.61	56.93	2.91
26.7	54.21	51.56	59.570	53.50	5.078	4.61	57.68	2.70
Nov. 5.7	54.81	53.09	59.903	52.86	5.387	6.12	58.42	2.90
15.7	55.36	55.21	60.230	52.28	5.686	8.09	59.14	3.52
25.6	55.84	57.84	60.543	51.79	5.966	10.43	59.82	4.55
Dec. 5.6	56.25	60.92	60.833	51.44	6.219	13.08	60.44	5.97
15.6	56.56	64.34	61.093	51.22	6.436	15.94	60.98	7.77
25.5	56.77	67.95	61.313	51.18	6.612	18.90	61.42	9.89
35.5	56.87	71.67	61.487	51.31	6.738	21.89	61.76	12.27
Mean Place	52.835	58.97	56.818	68.77	3.013	7.16	53.135	30.22
Sec δ , Tan δ	2.649	-2.453	1.132	+0.530	1.145	-0.558	2.743	+2.554
$D\psi\alpha$, $D\omega\alpha$	0.000	-0.054	+0.074	+0.012	+0.047	-0.013	+0.125	+0.060
$D\psi\delta$, $D\omega\delta$	-0.13	+0.94	-0.14	+0.94	-0.14	+0.94	-0.14	+0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Canis Minoris. Mag. 3.1		ρ Geminorum. Mag. 4.2		σ Argus. Mag. 3.3		α^2 Geminorum. (Castor.) Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 22	° ' " + 8 26	h m 7 24	° ' " +31 56	h m 7 26	° ' " -43 8	h m 7 29	° ' " +32 3
	s	"	s	"	s	"	s	"
Jan. 0.5	59.807 ¹²⁵	33.16 ¹⁰¹	11.012 ¹⁴⁹	8.57 ⁴⁶	49.207 ⁸⁸	48.27 ³⁴²	42.704 ¹⁵²	20.26 ⁴⁴
10.5	59.932 ⁷²	32.15 ⁸⁶	11.161 ⁹²	9.03 ⁶²	49.295 ²⁶	51.69 ³³³	42.856 ⁹⁸	20.70 ⁵⁹
20.5	60.004 ²⁵	31.29 ⁶⁹	11.253 ³²	9.65 ⁷²	49.321 ³⁷	55.02 ³¹²	42.954 ³⁸	21.29 ⁷³
30.5	60.029 ²⁸	30.60 ⁵⁴	11.285 ²⁴	10.37 ⁸¹	49.284 ⁹⁸	58.14 ²⁸⁵	42.992 ²¹	22.02 ⁸⁰
Feb. 9.4	60.001 ⁷⁰	30.06 ³⁶	11.261 ⁸⁰	11.18 ⁸³	49.186 ¹⁵²	60.99 ²¹⁹	42.971 ⁷³	22.82 ⁸⁴
19.4	59.931 ¹¹¹	29.70 ²²	11.181 ¹²⁷	12.01 ⁸¹	49.034 ¹⁹⁹	63.48 ²¹⁰	42.898 ¹²⁵	23.66 ⁸⁵
Mar. 1.4	59.820 ¹⁴³	29.48 ⁷	11.054 ¹⁶³	12.82 ⁷⁴	48.835 ²³⁶	65.58 ¹⁶⁷	42.773 ¹⁶⁰	24.51 ⁷⁷
11.3	59.677 ¹⁶⁵	29.41 ⁴	10.891 ¹⁹¹	13.56 ⁶³	48.599 ²⁶²	67.25 ¹²¹	42.613 ¹⁸⁹	25.28 ⁶⁴
21.3	59.512 ¹⁷⁹	29.45 ¹⁴	10.700 ²⁰⁶	14.19 ⁵⁰	48.337 ²⁷⁸	68.46 ⁷³	42.424 ²⁰⁴	25.92 ⁵¹
31.3	59.333 ¹⁷⁸	29.59 ²³	10.494 ²⁰⁸	14.69 ³⁵	48.059 ²⁸²	69.19 ²⁵	42.220 ²⁰⁶	26.46 ³⁸
Apr. 10.3	59.155 ¹⁷⁰	29.82 ³²	10.286 ¹⁹⁹	15.04 ¹⁸	47.777 ²⁷⁶	69.44 ²³	42.014 ²⁰¹	26.84 ²¹
20.2	58.985 ¹⁵⁵	30.14 ³⁸	10.087 ¹⁸¹	15.22 ⁴	47.501 ²⁵⁸	69.21 ⁷¹	41.813 ¹⁸³	27.05 ⁶
30.2	58.830 ¹³²	30.52 ¹⁶	9.906 ¹⁵³	15.26 ¹³	47.243 ¹¹⁵	68.50 ¹¹⁵	41.630 ¹⁶⁰	27.11 ¹¹
May 10.2	58.698 ¹⁰⁴	30.98 ⁵¹	9.753 ¹²⁰	15.13 ²⁶	47.006 ²³⁷	67.35 ¹⁵⁸	41.470 ¹²²	27.00 ²³
20.2	58.594 ⁶⁸	31.49 ⁵⁷	9.633 ⁸¹	14.87 ³⁸	46.803 ¹⁶⁵	65.77 ¹⁹⁷	41.348 ⁸⁶	26.77 ³⁹
30.1	58.526 ³⁴	32.06 ⁶³	9.552 ⁴⁰	14.49 ⁴⁸	46.638 ¹²⁴	63.80 ²²⁹	41.262 ⁴⁸	26.38 ⁴⁷
June 9.1	58.492 ⁰	32.69 ⁶⁹	9.512 ²	14.01 ⁵⁶	46.514 ⁸¹	61.51 ²⁵⁸	41.214 ⁴	25.91 ⁵⁷
19.1	58.492 ³⁹	33.38 ⁷⁹	9.514 ⁴⁸	13.45 ⁶¹	46.433 ³⁴	58.93 ²⁸⁰	41.210 ⁴¹	25.34 ⁶²
29.0	58.531 ⁷²	34.08 ⁷³	9.562 ⁸⁶	12.84 ⁶⁴	46.399 ¹³	56.13 ²⁹⁴	41.251 ⁷⁹	24.72 ⁶⁷
July 9.0	58.603 ¹⁰⁶	34.81 ⁷⁰	9.648 ¹²⁵	12.20 ⁶⁷	46.412 ⁶⁰	53.19 ²⁹⁹	41.330 ¹¹⁷	24.05 ⁷⁰
19.0	58.709 ¹³⁵	35.51 ⁶⁷	9.773 ¹⁶³	11.53 ⁶⁹	46.472 ¹⁰⁵	50.20 ²⁹⁶	41.447 ¹⁵⁸	23.35 ⁷²
29.0	58.844 ¹⁶⁶	36.18 ⁵⁸	9.936 ¹⁹³	10.84 ⁷⁰	46.577 ¹⁵⁰	47.24 ²⁸⁴	41.605 ¹⁸⁵	22.63 ⁷⁴
Aug. 7.9	59.010 ¹⁸⁸	36.76 ⁴⁹	10.129 ²²⁶	10.14 ⁷²	46.727 ¹⁹¹	44.40 ²⁶¹	41.790 ²²⁰	21.89 ⁷⁷
17.9	59.198 ²¹⁵	37.25 ³⁵	10.355 ²⁵¹	9.42 ⁷²	46.918 ²³⁰	41.79 ²³⁰	42.010 ²⁴⁶	21.12 ⁷⁹
27.9	59.413 ²³³	37.60 ¹⁷	10.606 ²⁷⁵	8.70 ⁷⁴	47.148 ²⁶⁵	39.49 ¹⁹⁰	42.256 ²⁷¹	20.33 ⁷⁹
Sept. 6.9	59.646 ²⁵³	37.77 ²	10.881 ²⁹⁶	7.96 ⁷⁵	47.413 ²⁹⁶	37.59 ¹⁴⁴	42.527 ²⁹⁴	19.54 ⁸²
16.8	59.899 ²⁷⁰	37.75 ²⁴	11.177 ³¹⁴	7.21 ⁷⁴	47.709 ³²¹	36.15 ⁸⁸	42.821 ³⁰⁹	18.72 ⁷⁸
26.8	60.169 ²⁸³	37.51 ⁴⁶	11.491 ³²⁹	6.47 ⁷⁴	48.030 ³⁴¹	35.27 ³⁰	43.130 ³²⁹	17.94 ⁸⁰
Oct. 6.8	60.452 ²⁹¹	37.05 ⁶⁷	11.820 ³³⁹	5.73 ⁷⁰	48.371 ³⁵³	34.97 ³¹	43.459 ³³⁹	17.14 ⁷⁷
16.7	60.743 ²⁹⁷	36.38 ⁸⁶	12.159 ³⁴⁶	5.03 ⁶⁵	48.724 ³⁵⁷	35.28 ⁹³	43.798 ³⁴⁷	16.37 ⁷⁰
26.7	61.040 ²⁹⁷	35.52 ¹⁰⁴	12.505 ³⁴⁷	4.38 ⁵⁹	49.081 ³⁵²	36.21 ¹⁵¹	44.145 ³⁴⁷	15.67 ⁶⁵
Nov. 5.7	61.337 ²⁹¹	34.48 ¹¹⁷	12.852 ³⁴¹	3.79 ⁴⁷	49.433 ³³⁹	37.72 ²⁰⁵	44.492 ³⁴²	15.02 ⁵²
15.7	61.628 ²⁷⁹	33.31 ¹²⁴	13.193 ³²⁷	3.32 ³⁴	49.772 ³¹³	39.77 ²⁵²	44.834 ³³⁰	14.50 ³⁹
25.6	61.907 ²⁵⁹	32.07 ¹²⁸	13.520 ³⁰⁴	2.98 ¹⁹	50.085 ²⁸¹	42.29 ³¹⁸	45.164 ²⁷⁷	14.11 ²³
Dec. 5.6	62.166 ²³¹	30.79 ¹²⁶	13.824 ²⁷⁴	2.79 ⁰	50.366 ²³⁶	45.20 ³¹⁸	45.474 ²⁷⁷	13.88 ⁴
15.6	62.397 ¹⁹⁷	29.53 ¹²¹	14.098 ²³¹	2.79 ¹⁸	50.602 ¹⁸⁴	48.38 ³³⁵	45.751 ²³⁸	13.84 ¹⁶
25.6	62.594 ¹⁵⁵	28.32 ¹⁰⁸	14.329 ¹⁸³	2.97 ³⁷	50.786 ¹²⁶	51.73 ³⁴⁰	45.989 ¹⁸⁸	14.00 ³⁵
35.5	62.749	27.24	14.512	3.34	50.912	55.13	46.177	14.35
Mean Place	58.581	44.12	9.690	20.95	47.211	41.42	41.397	32.79
Sec δ , Tan δ	1.011	+0.148	1.178	+0.623	1.371	-0.937	1.180	+0.626
$D\psi\alpha$, $D\omega\alpha$	+0.065	+0.004	+0.077	+0.015	+0.038	-0.023	+0.077	+0.016
$D\psi\delta$, $D\omega\delta$	-0.14	+0.94	-0.14	+0.93	-0.15	+0.93	-0.15	+0.92

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	25 Monocerotis. Mag. 5.2		α Canis Minoris. (Procyon.) Mag. 0.5		24 Lynceis. Mag. 5.0		κ Geminorum. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 33	° ' " - 3 56	h m 7 35	° ' " + 5 25	h m 7 36	° ' " +58 53	h m 7 39	° ' " +24 34
	s	"	s	"	s	"	s	"
Jan. 0.5	28.215 ¹²⁴	26.26 ¹⁷⁷	17.522 ¹³⁰	13.64 ¹²⁶	32.093 ²²⁹	18.12 ¹⁹⁶	49.350 ¹⁵⁶	49.45 ⁶
10.5	28.339 ⁷⁶	28.03 ¹⁷⁷	17.652 ⁷⁸	12.38 ¹⁰⁹	32.322 ¹³⁹	20.08 ²¹⁰	49.506 ¹⁰³	49.39 ¹¹
20.5	28.415 ²⁶	29.65 ¹⁴⁴	17.730 ²⁹	11.29 ⁹³	32.461 ⁴⁶	22.18 ²²⁰	49.609 ⁴⁶	49.50 ²⁵
30.5	28.441 ²⁴	31.09 ¹²³	17.759 ²⁰	10.36 ⁷³	32.507 ⁴⁶	24.38 ²¹⁹	49.655 ⁷	49.75 ⁴⁰
Feb. 9.4	28.417 ⁶⁹	32.32 ⁹⁹	17.739 ⁶⁸	9.63 ⁵⁵	32.461 ¹³³	26.57 ²⁰⁹	49.648 ⁶⁰	50.15 ⁴⁸
19.4	28.348 ¹⁰⁸	33.31 ⁷⁷	17.671 ¹⁰⁵	9.08 ³⁴	32.328 ²¹¹	28.66 ¹⁸⁷	49.588 ¹⁰⁵	50.63 ⁵⁴
Mar. 1.4	28.240 ¹⁴²	34.08 ⁵³	17.566 ¹⁴⁰	8.74 ²⁰	32.117 ²⁷²	30.53 ¹⁶³	49.483 ¹⁴²	51.17 ⁵⁴
11.4	28.098 ¹⁶³	34.61 ³²	17.426 ¹⁶¹	8.54 ⁶	31.845 ³²¹	32.16 ¹³⁰	49.341 ¹⁷⁰	51.71 ⁵¹
21.3	27.935 ¹⁷⁶	34.93 ⁹	17.265 ¹⁷⁶	8.48 ⁹	31.524 ³⁵¹	33.46 ⁹⁰	49.171 ¹⁸⁶	52.22 ⁴⁷
31.3	27.759 ¹⁸¹	35.02 ¹²	17.089 ¹⁷⁷	8.57 ²¹	31.173 ³⁶¹	34.36 ⁵⁰	48.985 ¹⁹²	52.69 ³⁹
Apr. 10.3	27.578 ¹⁷³	34.90 ³¹	16.912 ¹⁷¹	8.78 ²⁹	30.812 ³⁵⁴	34.86 ⁸	48.793 ¹⁸⁵	53.08 ³¹
20.2	27.405 ¹⁶¹	34.59 ⁵²	16.741 ¹⁵⁸	9.07 ⁴¹	30.458 ³³¹	34.94 ³¹	48.608 ¹⁷²	53.39 ²¹
30.2	27.244 ¹³⁷	34.07 ⁶⁹	16.583 ¹³⁵	9.48 ⁵¹	30.127 ²⁹⁵	34.63 ⁷²	48.436 ¹¹⁷	53.60 ¹²
May 10.2	27.107 ¹¹⁴	33.38 ⁸⁶	16.448 ¹⁰⁶	9.99 ⁶⁰	29.832 ²⁴³	33.91 ¹⁰⁸	48.289 ¹¹⁸	53.72 ⁴
20.2	26.993 ⁸⁰	32.52 ¹⁰¹	16.342 ⁷⁵	10.59 ⁶⁵	29.589 ¹⁸⁶	32.83 ¹³⁷	48.171 ⁸⁶	53.76 ⁵
30.1	26.913 ⁴⁹	31.51 ¹¹⁵	16.267 ⁴³	11.24 ⁷³	29.403 ¹²²	31.46 ¹⁶⁶	48.085 ⁴⁸	53.71 ¹⁰
June 9.1	26.864 ¹¹	30.36 ¹²⁴	16.224 ⁸	11.97 ⁷⁸	29.281 ⁵¹	29.80 ¹⁸⁶	48.037 ⁹	53.61 ¹⁷
19.1	26.850 ²¹	29.12 ¹³³	16.216 ²⁷	12.75 ⁸²	29.230 ¹⁵	27.94 ²⁰⁰	48.028 ²⁸	53.44 ²¹
29.1	26.871 ⁵⁵	27.79 ¹³⁷	16.243 ⁶³	13.57 ⁸²	29.245 ⁸⁷	25.94 ²¹¹	48.056 ⁶⁶	53.23 ²⁵
July 9.0	26.926 ⁸⁸	26.42 ¹³⁷	16.306 ⁹⁵	14.39 ⁸¹	29.332 ¹⁴⁹	23.83 ²¹⁷	48.122 ¹⁰³	52.98 ²⁸
19.0	27.014 ¹¹⁸	25.05 ¹³²	16.401 ¹²⁴	15.20 ⁷⁷	29.481 ²¹³	21.66 ²¹⁶	48.225 ¹³⁵	52.70 ³³
29.0	27.132 ¹⁴⁷	23.73 ¹²³	16.525 ¹⁵³	15.97 ⁶⁸	29.694 ²⁷¹	19.50 ²¹²	48.360 ¹⁶⁸	52.37 ³⁸
Aug. 7.9	27.279 ¹⁷³	22.50 ¹⁰⁹	16.678 ¹⁸¹	16.65 ⁵⁶	29.965 ³²⁵	17.38 ²⁰⁶	48.528 ¹⁹⁴	51.99 ⁴³
17.9	27.452 ¹⁹⁸	21.41 ⁸⁹	16.859 ²⁰⁴	17.21 ⁴⁰	30.290 ³⁷²	15.32 ¹⁹¹	48.722 ²²³	51.56 ⁴⁹
27.9	27.650 ²²¹	20.52 ⁶³	17.063 ²²⁶	17.61 ²¹	30.662 ⁴¹⁶	13.41 ¹⁷⁵	48.945 ²¹⁵	51.07 ⁵⁵
Sept. 6.9	27.871 ²⁴⁰	19.89 ³⁷	17.289 ²¹¹	17.82 ⁰	31.078 ⁴⁵⁶	11.66 ¹⁵⁸	49.190 ²⁶⁷	50.52 ⁶⁵
16.8	28.111 ²⁵⁸	19.52 ⁴	17.533 ²⁶²	17.82 ²⁴	31.534 ⁴⁸⁶	10.08 ¹³⁷	49.457 ²⁸⁷	49.87 ⁷¹
26.8	28.369 ²⁷³	19.48 ²⁸	17.795 ²⁷⁶	17.58 ⁴⁸	32.020 ⁵¹³	8.71 ¹¹⁰	49.744 ³⁰²	49.16 ⁷⁸
Oct. 6.8	28.642 ²⁸⁴	19.76 ⁶³	18.071 ²⁸⁸	17.10 ⁷³	32.533 ⁵³²	7.61 ⁸⁴	50.046 ³¹⁵	48.38 ⁸¹
16.8	28.926 ²⁹⁰	20.39 ⁹⁴	18.359 ²⁹³	16.37 ⁹⁷	33.065 ⁵⁴²	6.77 ⁵¹	50.361 ³²⁴	47.57 ⁸⁶
26.7	29.216 ²⁹³	21.33 ¹²⁴	18.652 ²⁹⁵	15.40 ¹¹⁶	33.607 ⁵⁴³	6.26 ²⁰	50.685 ³²⁸	46.71 ⁸⁶
Nov. 5.7	29.509 ²⁸⁷	22.57 ¹⁴⁹	18.947 ²⁹¹	14.24 ¹³³	34.150 ⁵³⁴	6.06 ¹⁷	51.013 ³²⁶	45.85 ⁸²
15.7	29.796 ²⁷⁶	24.06 ¹⁶⁹	19.238 ²⁸⁰	12.91 ¹⁴²	34.684 ⁵¹⁰	6.23 ⁵²	51.339 ³¹⁵	45.03 ⁷⁶
25.6	30.072 ²⁵⁹	25.75 ¹⁸²	19.518 ²⁶²	11.49 ¹⁴⁹	35.194 ⁴⁷⁰	6.75 ⁹⁰	51.654 ²⁹⁵	44.27 ⁶⁵
Dec. 5.6	30.331 ²²⁹	27.57 ¹⁹⁰	19.780 ²³³	10.00 ¹⁴⁹	35.669 ⁴²⁴	7.65 ¹²⁴	51.949 ²⁷⁰	43.62 ⁵⁰
15.6	30.560 ¹⁹⁶	29.47 ¹⁸⁹	20.013 ¹⁹⁹	8.51 ¹⁴⁴	36.093 ³⁶¹	8.89 ¹⁵⁶	52.219 ²³¹	43.12 ³⁴
25.6	30.756 ¹⁵⁴	31.36 ¹⁸²	20.212 ¹⁵⁹	7.07 ¹³¹	36.454 ²⁸⁶	10.45 ¹⁸⁴	52.450 ¹⁸⁹	42.78 ¹⁶
35.5	30.910	33.18	20.371	5.76	36.740	12.29	52.639	42.62
Mean Place	26.954	16.45	16.327	23.65	30.125	32.11	48.131	61.69
Sec δ , Tan δ	1.002	-0.069	1.004	+0.095	1.935	+1.657	1.100	+0.457
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.002	+0.063	+0.003	+0.101	+0.045	+0.072	+0.013
$D\psi\delta$, $D\omega\delta$	-0.16	+0.92	-0.16	+0.91	-0.16	+0.91	-0.17	+0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Geminorum. (Pollux.) Mag. 1.2		ϵ Puppis. Mag. 5.1		ξ Argus. Mag. 3.5		ϕ Geminorum. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 40	° ' " +28 12	h m 7 42	° ' " -14 22	h m 7 46	° ' " -24 39	h m 7 48	° ' " +26 57
	s	"	s	"	s	"	s	"
Jan. 0.5	37.659 158	35.74 15	25.490 127	41.01 235	4.847 121	63.43 283	48.493 169	46.51 4
10.5	37.817 105	35.89 33	25.617 77	43.36 223	4.971 73	66.26 273	48.662 115	46.55 24
20.5	37.922 49	36.22 49	25.694 25	45.59 202	5.044 19	68.99 253	48.777 59	46.79 40
30.5	37.971 11	36.71 59	25.719 24	47.61 180	5.063 34	71.52 230	48.836 1	47.19 53
Feb. 9.4	37.960 62	37.30 68	25.695 71	49.41 152	5.029 82	73.82 200	48.837 52	47.72 63
19.4	37.898 108	37.98 70	25.624 112	50.93 124	4.947 125	75.82 167	48.785 100	48.35 66
Mar. 1.4	37.790 145	38.68 68	25.512 144	52.17 95	4.822 160	77.49 131	48.685 138	49.01 67
11.4	37.645 177	39.36 61	25.368 169	53.12 61	4.662 184	78.80 97	48.547 169	49.68 64
21.3	37.468 193	39.97 54	25.199 183	53.76 33	4.478 200	79.77 58	48.378 186	50.32 56
31.3	37.275 199	40.51 43	25.016 188	54.09 4	4.278 206	80.35 20	48.192 194	50.88 46
Apr. 10.3	37.076 191	40.94 30	24.828 184	54.13 25	4.072 203	80.55 16	47.998 190	51.34 35
20.2	36.885 181	41.24 20	24.644 171	53.88 53	3.869 192	80.39 53	47.808 177	51.69 22
30.2	36.704 155	41.44 2	24.473 153	53.35 81	3.677 171	79.86 88	47.631 154	51.91 11
May 10.2	36.549 124	41.46 8	24.320 126	52.54 105	3.506 147	78.98 120	47.477 126	52.02 0
20.2	36.425 92	41.38 20	24.194 97	51.49 129	3.359 117	77.78 150	47.351 93	52.02 11
30.1	36.333 52	41.18 23	24.097 64	50.20 118	3.242 84	76.28 177	47.258 56	51.91 21
June 9.1	36.281 10	40.95 35	24.033 31	48.72 165	3.158 49	74.51 198	47.202 18	51.70 26
19.1	36.271 24	40.60 42	24.002 3	47.07 178	3.109 13	72.53 217	47.184 21	51.44 34
29.1	36.295 64	40.18 46	24.005 38	45.29 185	3.096 23	70.36 228	47.205 58	51.10 39
July 9.0	36.359 105	39.72 50	24.043 72	43.44 187	3.119 59	68.08 232	47.263 91	50.71 45
19.0	36.464 137	39.22 51	24.115 104	41.57 184	3.178 93	65.76 230	47.357 129	50.26 50
29.0	36.601 169	38.68 59	24.219 134	39.73 174	3.271 128	63.46 220	47.486 162	49.76 54
Aug. 7.9	36.770 200	38.09 63	24.353 163	37.99 157	3.399 159	61.26 201	47.648 189	49.22 60
17.9	36.970 225	37.46 67	24.516 189	36.42 135	3.558 189	59.25 177	47.837 218	48.62 65
27.9	37.195 252	36.79 71	24.705 214	35.07 105	3.747 217	57.48 145	48.055 213	47.97 72
Sept. 6.9	37.447 274	36.08 76	24.919 236	34.02 71	3.964 242	56.03 105	48.298 266	47.25 78
16.8	37.721 295	35.32 82	25.155 257	33.31 33	4.206 265	54.98 61	48.564 287	46.47 83
26.8	38.016 308	34.50 82	25.412 273	32.98 9	4.471 283	54.37 12	48.851 305	45.64 88
Oct. 6.8	38.324 325	33.68 85	25.685 286	33.07 51	4.754 297	54.25 38	49.156 319	44.76 91
16.8	38.649 333	32.83 84	25.971 294	33.58 93	5.051 307	54.63 88	49.475 330	43.85 92
26.7	38.982 337	31.99 80	26.265 297	34.51 133	5.358 309	55.51 135	49.805 335	42.93 89
Nov. 5.7	39.319 333	31.19 75	26.562 293	35.84 168	5.667 303	56.86 181	50.140 334	42.04 84
15.7	39.652 326	30.44 61	26.855 282	37.52 197	5.970 291	58.67 218	50.474 326	41.20 73
25.6	39.978 305	29.83 50	27.137 261	39.49 221	6.261 269	60.85 248	50.800 307	40.47 61
Dec. 5.6	40.283 276	29.33 31	27.398 235	41.70 233	6.530 239	63.33 269	51.107 282	39.86 44
15.6	40.559 239	29.02 14	27.633 197	44.03 240	6.769 201	66.02 281	51.389 245	39.42 25
25.6	40.798 192	28.88 7	27.830 156	46.43 237	6.970 151	68.83 282	51.634 200	39.17 6
35.5	40.990	28.95	27.986	48.80	7.124	71.65	51.834	39.11
Mean Place	36.420	48.27	24.144	32.51	3.351	56.20	47.291	59.10
Sec δ , Tan δ	1.135	+0.536	1.032	-0.256	1.100	-0.459	1.122	+0.509
$D\psi\alpha$, $D\omega\alpha$	+0.074	+0.015	+0.055	-0.007	+0.050	-0.014	+0.073	+0.015
$D\psi\delta$, $D\omega\delta$	-0.17	+0.91	-0.17	+0.90	-0.18	+0.89	-0.18	+0.89

APPARENT PLACES OF STARS, 1923.

383

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	26 Lyncis. Mag. 5.7			Groombridge 1374. Mag. 5.6			χ Argus. Mag. 3.6			ω Cancr. Mag. 5.9		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "	h m	s	° ' "
	7 49		+47 45	7 50		+74 7	7 54		-52 46	7 56		+25 35
Jan. 0.6	8.290	209	42.20	64.15	41	18.34	51.789	124	35.30	17.644	175	64.50
10.5	8.499	110	43.49	64.56	25	20.92	51.913	51	38.97	17.819	122	64.42
20.5	8.639	64	44.97	64.81	8	23.67	51.964	24	42.60	17.941	66	64.55
30.5	8.707	7	46.60	64.89	9	26.51	51.940	96	46.08	18.007	10	64.86
Feb. 9.4	8.700	76	48.29	64.80	26	29.31	51.844	184	49.36	18.017	44	65.31
19.4	8.624		49.95	64.54		32.00	51.680		52.32	17.973		65.87
Mar. 1.4	8.484	140	51.53	64.15	39	34.41	51.458	222	54.91	17.881	92	66.50
11.4	8.295	189	52.94	63.63	52	36.50	51.190	268	57.09	17.749	132	67.15
21.3	8.065	230	54.13	63.02	61	38.15	50.883	307	58.78	17.587	162	67.77
31.3	7.809	266	55.05	62.34	68	39.35	50.554	329	60.00	17.406	181	68.34
Apr. 10.3	7.543		55.67	61.62		40.00	50.211		60.72	17.217		68.83
20.3	7.282	261	55.96	60.91	71	40.14	49.867	344	60.92	17.030	187	69.22
30.2	7.034	248	55.94	60.23	68	39.76	49.535	332	60.61	16.854	176	69.50
May 10.2	6.816	218	55.59	59.60	63	38.88	49.222	313	59.80	16.700	154	69.67
20.2	6.633	183	54.96	59.05	55	37.54	48.940	282	58.52	16.573	127	69.73
30.1	6.494	91	54.07	58.60	34	35.78	48.694	204	56.79	16.476	60	69.70
June 9.1	6.403	41	52.95	58.26	22	33.68	48.490	155	54.67	16.416	23	69.58
19.1	6.362	12	51.66	58.04	9	31.29	48.335	105	52.18	16.393	14	69.39
29.1	6.374	62	50.21	57.95	4	28.68	48.230	50	49.42	16.407	49	69.11
July 9.0	6.436	113	48.66	57.99	17	25.92	48.180	5	46.45	16.456	86	68.79
19.0	6.549	159	47.03	58.16	29	23.09	48.185	59	43.35	16.542	120	68.41
29.0	6.708	203	45.37	58.45	41	20.24	48.244	117	40.22	16.662	152	67.97
Aug. 8.0	6.911	244	43.70	58.86	52	17.46	48.361	172	37.14	16.814	180	67.48
17.9	7.155	280	42.07	59.38	62	14.79	48.533	223	34.25	16.994	209	66.92
27.9	7.435	315	40.46	60.00	71	12.27	48.756	273	31.59	17.203	234	66.29
Sept. 6.9	7.750		38.93	60.71		9.97	49.029		29.32	17.437		65.58
16.8	8.096	346	37.49	61.50	79	7.92	49.344	315	27.50	17.695	258	64.81
26.8	8.468	372	36.17	62.36	86	6.18	49.699	355	26.21	17.973	278	63.96
Oct. 6.8	8.864	396	35.00	63.27	91	4.78	50.083	384	25.50	18.271	298	63.05
16.8	9.277	413	33.99	64.22	95	3.79	50.490	407	25.41	18.585	314	62.10
26.7	9.703	426	33.20	65.20	98	3.24	50.908	418	25.98	18.911	326	61.12
Nov. 5.7	10.135	432	32.64	66.18	98	3.10	51.326	418	27.19	19.243	332	60.14
15.7	10.563	428	32.34	67.14	96	3.43	51.732	406	29.00	19.576	333	59.21
25.7	10.979	416	32.33	68.06	92	4.24	52.114	382	31.36	19.902	326	58.37
Dec. 5.6	11.370	391	32.63	68.91	85	5.50	52.458	344	34.20	20.210	284	57.66
15.6	11.727	357	33.23	69.67	76	7.22	52.753	295	37.39	20.495	285	57.10
25.6	12.036	309	34.12	70.32	65	9.30	52.989	236	40.85	20.744	249	56.73
35.5	12.288	252	35.29	70.83	51	11.73	53.159	170	44.46	20.948	204	56.56
Mean Place	6.812		56.33	60.698		33.44	49.298		31.62	16.474		77.07
Sec δ, Tan δ	1.488		+1.101	3.656		+3.516	1.653		-1.317	1.109		+0.479
Dψα, Dωα	+0.087		+0.034	+0.144		+0.109	+0.031		-0.042	+0.072		+0.016
Dψδ, Dωδ	-0.18		+0.89	-0.19		+0.89	-0.19		+0.88	-0.19		+0.87

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Geminorum. Mag. 5.0		27 Lynceis. Mag. 4.9		ρ Argus. Mag. 2.9		3 H. Ursæ Majoris. Mag. 5.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 7 58 s	° ' +28 0 "	h m 8 2 s	° ' +51 43 "	h m 8 4 s	° ' -24 4 "	h m 8 5 s	° ' +68 41 "
Jan. 0.6	48.749 ¹⁸⁰	27.95 ⁷	42.066 ²⁴²	33.62 ¹⁴⁴	17.330 ¹⁴⁵	59.13 ²⁸³	12.72 ³⁶	53.77 ²²⁵
10.5	48.929 ¹²⁸	28.02 ²⁷	42.308 ¹⁶⁷	35.06 ¹⁶⁸	17.475 ⁹¹	61.96 ²⁷⁷	13.08 ²¹	56.02 ²⁴⁸
20.5	49.057 ⁶⁹	28.29 ⁴⁶	42.475 ⁸⁹	36.74 ¹⁸³	17.566 ⁴⁰	64.73 ²⁵⁷	13.32 ¹²	58.50 ²⁸³
30.5	49.126 ¹²	28.75 ⁵⁹	42.564 ⁸	38.57 ¹⁹¹	17.606 ¹⁵	67.30 ²³¹	13.44 ¹	61.13 ²⁸⁶
Feb. 9.5	49.138 ⁴³	29.34 ⁶⁹	42.572 ⁶⁵	40.48 ¹⁸⁹	17.591 ⁶⁵	69.64 ²⁰⁶	13.43 ¹⁵	63.79 ²⁵⁶
19.4	49.095 ⁹⁰	30.03 ⁷⁴	42.507 ¹³⁷	42.37 ¹⁸⁰	17.526 ¹⁰¹	71.70 ¹⁷⁶	13.28 ²⁵	66.35 ²⁴⁰
Mar. 1.4	49.005 ¹³³	30.77 ⁷⁶	42.370 ¹⁹⁴	44.17 ¹⁶⁴	17.422 ¹⁴⁴	73.46 ¹⁴²	13.03 ³⁶	68.75 ²¹¹
11.4	48.872 ¹⁶⁴	31.53 ⁷¹	42.176 ²⁴¹	45.81 ¹⁴⁰	17.278 ¹⁷³	74.88 ¹⁰⁴	12.67 ⁴³	70.86 ¹⁷⁴
21.3	48.708 ¹⁸³	32.24 ⁶³	41.935 ²⁷¹	47.21 ¹¹⁰	17.105 ¹⁹²	75.92 ⁷⁰	12.24 ⁴⁸	72.60 ¹³³
31.3	48.525 ¹⁹⁴	32.87 ⁵²	41.664 ²⁸⁸	48.31 ⁷⁷	16.913 ¹⁹⁸	76.62 ³²	11.76 ⁵²	73.93 ⁸⁶
Apr. 10.3	48.331 ¹⁹¹	33.39 ⁴¹	41.376 ²⁸⁷	49.08 ¹²	16.715 ¹⁹⁷	76.94 ³	11.24 ⁵²	74.79 ³³
20.3	48.140 ¹⁷⁹	33.80 ²⁷	41.089 ²⁷⁶	49.50 ⁵	16.518 ¹⁹²	76.91 ⁴⁰	10.72 ⁵¹	75.15 ¹³
30.2	47.961 ¹⁶¹	34.07 ¹⁴	40.813 ²⁴⁸	49.55 ²⁸	16.326 ¹⁷³	76.51 ⁷⁶	10.21 ⁴⁷	75.02 ⁶²
May 10.2	47.800 ¹³²	34.21 ⁰	40.565 ²¹⁴	49.27 ⁶¹	16.153 ¹⁵¹	75.75 ¹⁰⁵	9.74 ⁴¹	74.40 ¹⁰⁶
20.2	47.668 ¹⁰⁰	34.21 ¹¹	40.351 ¹⁶⁹	48.63 ⁹⁴	15.999 ¹²¹	74.70 ¹³⁸	9.33 ³⁵	73.34 ¹¹⁶
30.2	47.568 ⁶⁴	34.10 ²¹	40.182 ¹²⁰	47.69 ¹²¹	15.875 ⁹⁵	73.32 ¹⁶⁴	8.98 ²⁷	71.88 ¹⁸²
June 9.1	47.504 ²⁸	33.89 ³²	40.062 ⁶⁶	46.48 ¹¹³	15.780 ⁶³	71.68 ¹⁸⁷	8.71 ¹⁷	70.06 ²¹²
19.1	47.476 ⁹	33.57 ⁴⁰	39.996 ¹³	45.05 ¹⁶¹	15.717 ²⁸	69.81 ²⁰⁶	8.54 ⁷	67.94 ²³⁵
29.1	47.485 ⁵⁰	33.17 ⁴⁷	39.983 ⁴³	43.44 ¹⁷⁵	15.689 ⁶	67.75 ²¹⁸	8.47 ¹	65.59 ²⁵²
July 9.0	47.535 ⁸⁴	32.70 ⁵³	40.026 ⁹⁶	41.69 ¹⁸⁶	15.695 ¹¹	65.57 ²²²	8.48 ¹¹	63.07 ²⁶³
19.0	47.619 ¹²⁰	32.17 ⁵⁹	40.122 ¹⁴⁷	39.83 ¹⁹¹	15.736 ⁷⁷	63.35 ²²⁴	8.59 ²⁰	60.44 ²⁶⁹
29.0	47.739 ¹⁵²	31.58 ⁶⁴	40.269 ¹⁹⁶	37.92 ¹⁹³	15.813 ¹⁰⁸	61.11 ²¹⁸	8.79 ²⁹	57.75 ²⁶⁷
Aug. 8.0	47.891 ¹⁸¹	30.94 ⁷¹	40.465 ²⁴²	35.99 ¹⁹³	15.921 ¹¹³	58.93 ²⁰⁰	9.08 ³⁷	55.08 ²⁶¹
17.9	48.072 ²¹¹	30.23 ⁷⁶	40.707 ²⁸⁵	34.06 ¹⁸⁷	16.064 ¹⁷³	56.93 ¹⁷⁵	9.45 ⁴⁵	52.47 ²⁵⁰
27.9	48.283 ²³⁸	29.47 ⁸²	40.992 ³²¹	32.19 ¹⁷⁹	16.237 ²⁰⁰	55.18 ¹¹⁷	9.90 ⁵¹	49.97 ²³³
Sept. 6.9	48.521 ²⁶¹	28.65 ⁸⁸	41.313 ³⁵⁹	30.40 ¹⁶⁹	16.437 ²³⁰	53.71 ¹⁰⁹	10.41 ⁵⁸	47.64 ²¹²
16.8	48.782 ²⁸⁴	27.77 ⁹³	41.672 ³⁹⁰	28.71 ¹⁵⁵	16.667 ²⁵⁴	52.62 ⁸⁷	10.99 ⁶⁴	45.52 ¹⁸⁷
26.8	49.066 ³⁰²	26.84 ⁹⁹	42.062 ⁴¹⁶	27.16 ¹³⁹	16.921 ²⁷⁶	51.95 ²⁰	11.63 ⁶⁸	43.65 ¹⁵⁶
Oct. 6.8	49.368 ³²⁰	25.85 ⁹⁹	42.478 ⁴⁴⁰	25.77 ¹¹⁸	17.197 ²⁹⁴	51.75 ³⁰	12.31 ⁷¹	42.09 ¹²³
16.8	49.688 ³³²	24.86 ¹⁰⁰	42.918 ⁴⁵⁷	24.59 ⁹⁴	17.491 ³⁰⁶	52.05 ⁷⁹	13.02 ⁷⁴	40.86 ⁸⁵
26.7	50.020 ³⁴⁰	23.86 ⁹⁵	43.375 ⁴⁶⁵	23.65 ⁶⁶	17.797 ³¹⁰	52.84 ¹²⁷	13.76 ⁷⁶	40.01 ⁴⁵
Nov. 5.7	50.360 ³³⁹	22.91 ⁸⁹	43.840 ⁴⁸⁴	22.99 ³⁸	18.107 ³⁰⁹	54.11 ¹⁷⁰	14.52 ⁷³	39.56 ¹
15.7	50.699 ³³²	22.02 ⁷⁸	44.304 ⁴⁵³	22.61 ³	18.416 ²⁹⁹	55.81 ²⁰⁹	15.26 ⁷¹	39.55 ⁴⁵
25.7	51.031 ³¹⁶	21.24 ⁶⁴	44.757 ⁴³⁰	22.58 ³⁰	18.715 ²⁷⁹	57.90 ²⁴³	15.99 ⁶⁸	40.00 ⁹⁰
Dec. 5.6	51.347 ²⁹²	20.60 ⁴⁵	45.187 ³⁹⁴	22.88 ⁶⁵	18.994 ²⁵⁶	60.33 ²⁶³	16.67 ⁶²	40.90 ¹³⁴
15.6	51.639 ²⁵⁷	20.15 ²⁷	45.581 ³⁴⁷	23.53 ⁹⁸	19.250 ²¹⁷	62.96 ²⁷⁹	17.29 ⁵⁴	42.24 ¹⁷⁵
25.6	51.896 ²¹³	19.88 ³	45.928 ²⁸⁷	24.51 ¹³⁰	19.467 ¹⁷⁴	65.75 ²⁸⁶	17.83 ⁴⁴	43.99 ²⁰⁸
35.5	52.109	19.85	46.215	25.81	19.641	68.61	18.27	46.07
Mean Place	47.576	40.80	40.564	48.54	15.865	52.88	10.278	69.56
Sec δ, Tan δ	1.133	+0.532	1.614	+1.267	1.095	-0.447	2.753	+2.565
Dψα, Dωα	+0.073	+0.018	+0.090	+0.043	+0.051	-0.015	+0.119	+0.089
Dψδ, Dωδ	-0.20	+0.87	-0.20	+0.86	-0.21	+0.86	-0.21	+0.85

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Argus. Mag. 2.2		ζ Cancri (<i>mean</i>). Mag. 4.7		20 Puppis. Mag. 5.0		Bradley 1147. Mag. 5.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 7	° ' " -47 6	h m 8 7	° ' " +17 52	h m 8 9	° ' " -15 33	h m 8 9	° ' " +75 59
	s	"	s	"	s	"	s	"
Jan. 0.6	11.811 ¹⁴⁴	36.33 ³⁵⁹	49.020 ¹⁷⁷	40.62 ⁵⁹	48.941 ¹⁵³	26.19 ²⁴⁷	58.28 ⁵²	22.50 ²⁵³
10.5	11.955 ⁷⁷	39.92 ³⁵⁴	49.197 ¹²⁷	40.03 ⁴⁰	49.094 ¹⁰⁴	28.66 ²³⁶	58.80 ³⁴	25.03 ²⁷⁵
20.5	12.032 ¹⁰	43.46 ³⁴¹	49.324 ⁷³	39.63 ²⁰	49.198 ⁵²	31.02 ²¹⁶	59.14 ¹⁶	27.78 ²⁸⁰
30.5	12.042 ⁵⁷	46.87 ³²¹	49.397 ²⁰	39.43 ³	49.250 ¹	33.18 ¹⁹⁶	59.30 ⁴	30.67 ²⁹¹
Feb. 9.5	11.985 ¹¹⁷	50.08 ²⁹³	49.417 ³¹	39.40 ¹¹	49.251 ⁴⁷	35.14 ¹⁷⁰	59.26 ²²	33.58 ²⁸²
19.4	11.868 ¹⁷⁴	53.01 ²⁵⁶	49.386 ⁷⁷	39.54 ²⁶	49.204 ⁸⁸	36.84 ¹⁴¹	59.04 ³⁹	36.40 ²⁶¹
Mar. 1.4	11.694 ²¹⁷	55.57 ²¹⁷	49.309 ¹¹⁷	39.80 ³⁵	49.116 ¹²⁷	38.25 ¹¹¹	58.65 ⁵⁴	39.01 ²²⁹
11.4	11.477 ²⁵⁵	57.74 ¹⁷²	49.192 ¹⁴⁶	40.15 ⁴⁰	48.989 ¹⁵¹	39.36 ⁸⁰	58.11 ⁶⁶	41.30 ¹⁸⁹
21.3	11.222 ²⁷⁶	59.46 ¹²⁶	49.046 ¹⁶⁷	40.55 ⁴³	48.835 ¹⁷³	40.16 ⁵⁰	57.45 ⁷⁴	43.19 ¹⁴²
31.3	10.946 ²⁹²	60.72 ⁷⁷	48.879 ¹⁷⁵	40.98 ⁴³	48.662 ¹⁸²	40.66 ²⁰	56.71 ⁸⁰	44.61 ⁹²
Apr. 10.3	10.654 ²⁹⁴	61.49 ²⁸	48.704 ¹⁷⁵	41.41 ⁴¹	48.480 ¹⁸²	40.86 ¹²	55.91 ⁸¹	45.53 ³⁷
20.3	10.360 ²⁸⁴	61.77 ²⁰	48.529 ¹⁶⁵	41.82 ³⁸	48.298 ¹⁷⁴	40.74 ⁴⁰	55.10 ⁷⁹	45.90 ¹⁵
30.2	10.076 ²⁷⁰	61.57 ⁶⁹	48.364 ¹⁴⁹	42.20 ³¹	48.124 ¹⁵⁹	40.34 ⁶⁹	54.31 ⁷⁴	45.75 ⁶⁹
May 10.2	9.806 ²⁴⁴	60.88 ¹¹⁵	48.215 ¹²⁴	42.54 ³⁰	47.965 ¹³⁷	39.65 ⁹³	53.57 ⁶⁷	45.06 ¹¹⁸
20.2	9.562 ²¹⁵	59.73 ¹⁵⁸	48.091 ⁹⁷	42.84 ²⁶	47.828 ¹¹³	38.72 ¹¹⁷	52.90 ⁵⁶	43.88 ¹⁶²
30.2	9.347 ¹⁷⁶	58.15 ¹⁹⁷	47.994 ⁶⁴	43.10 ²¹	47.715 ⁸²	37.55 ¹⁴⁰	52.34 ⁴⁵	42.26 ²⁰²
June 9.1	9.171 ¹³⁵	56.18 ²³³	47.930 ³¹	43.31 ¹⁹	47.633 ⁵⁴	36.15 ¹⁵⁷	51.89 ³²	40.24 ²³⁵
19.1	9.036 ⁹³	53.85 ²⁶⁰	47.899 ²	43.50 ¹⁴	47.579 ¹⁹	34.58 ¹⁷¹	51.57 ¹⁹	37.89 ²⁶¹
29.1	8.943 ⁴¹	51.25 ²⁸²	47.901 ³⁷	43.64 ¹⁰	47.560 ¹³	32.87 ¹⁸¹	51.38 ³	35.28 ²⁷⁸
July 9.0	8.899 ¹	48.43 ²⁹⁵	47.938 ⁷¹	43.74 ⁴	47.573 ⁴⁵	31.06 ¹⁸⁵	51.35 ¹⁰	32.50 ²⁹²
19.0	8.900	45.48 ²⁹⁹	48.009 ¹⁰¹	43.78 ¹	47.618 ⁷⁶	29.21 ¹⁸³	51.45 ²⁵	29.58 ²⁹⁵
29.0	8.952 ⁵²	42.49 ²⁹¹	48.110 ¹³²	43.77 ⁹	47.694 ¹⁰⁸	27.38 ¹⁷⁵	51.70 ³⁸	26.63 ²⁹⁶
Aug. 8.0	9.052 ¹⁰⁰	39.55 ²⁸⁰	48.242 ¹⁶⁰	43.68 ¹⁹	47.802 ¹³⁸	25.63 ¹⁶²	52.08 ⁵¹	23.67 ²⁸⁶
17.9	9.198 ¹⁴⁶	36.75 ²⁵⁶	48.402 ¹⁸⁷	43.49 ²⁹	47.940 ¹⁶⁶	24.01 ¹³⁹	52.59 ⁶²	20.81 ²⁷⁴
27.9	9.392 ²³⁶	34.19 ²²²	48.589 ²¹²	43.20 ⁴¹	48.106 ¹⁹²	22.62 ¹¹²	53.21 ⁷⁴	18.07 ²⁵⁵
Sept. 6.9	9.628 ²⁷⁸	31.97 ¹⁷⁸	48.801 ²³⁶	42.79 ⁵⁵	48.298 ²²⁰	21.50 ⁸⁰	53.95 ⁸⁴	15.52 ²²⁹
16.9	9.906 ³¹²	30.19 ¹²⁸	49.027 ²⁵⁸	42.24 ⁷⁰	48.518 ²¹⁴	20.70 ⁴³	54.79 ⁹²	13.23 ²⁰³
26.8	10.218 ³⁴⁴	28.91 ⁷³	49.295 ²⁷⁸	41.54 ⁸²	48.762 ²⁶³	20.27 ¹	55.71 ⁹⁹	11.20 ¹⁶⁵
Oct. 6.8	10.562 ³⁶⁶	28.18 ¹¹	49.573 ²⁹⁴	40.72 ⁹⁵	49.025 ²⁸²	20.28 ⁴²	56.70 ¹⁰⁵	9.55 ¹³⁰
16.8	10.928 ³⁷⁹	28.07 ⁵⁰	49.867 ³⁰⁹	39.77 ¹⁰⁷	49.307 ²⁹⁴	20.70 ⁸⁵	57.75 ¹⁰⁸	8.25 ⁸⁶
26.7	11.307 ³⁸⁴	28.57 ¹¹³	50.176 ³¹⁷	38.70 ¹¹³	49.601 ³⁰²	21.55 ¹²⁵	58.83 ¹⁰⁹	7.39 ⁴⁰
Nov. 5.7	11.691 ³⁸⁰	29.70 ¹⁷²	50.493 ³¹⁹	37.57 ¹¹⁸	49.903 ³⁰³	22.80 ¹⁶⁴	59.92 ¹⁰⁹	6.99 ⁹
15.7	12.071 ³⁶¹	31.42 ²²⁷	50.812 ³¹⁴	36.39 ¹¹⁶	50.206 ²⁹⁴	24.44 ¹⁹⁵	61.01 ¹⁰⁶	7.08 ⁵⁷
25.7	12.432 ³³³	33.69 ²⁷¹	51.126 ³⁰⁰	35.23 ¹¹¹	50.500 ²⁸⁰	26.39 ²²²	62.07 ⁸⁹	7.65 ¹⁰⁶
Dec. 5.6	12.765 ²⁹⁰	36.40 ³⁰⁹	51.426 ²⁷⁸	34.12 ¹⁰⁰	50.780 ²⁵⁵	28.61 ²³⁸	63.06 ⁸⁹	8.71 ¹⁵⁶
15.6	13.055 ²⁴¹	39.49 ³³⁴	51.704 ²⁴⁶	33.12 ⁸⁷	51.035 ²²³	30.99 ²⁴⁸	63.95 ⁷⁸	10.27 ¹⁹⁶
25.6	13.296 ¹⁸³	42.83 ³⁵⁰	51.950 ²⁰⁶	32.25 ⁶⁸	51.258 ¹⁸²	33.47 ²⁴⁸	64.73 ⁶³	12.23 ²³⁶
35.6	13.479	46.33	52.156	31.57	51.440	35.95	65.36	14.59
Mean Place	9.645	33.15	47.905	52.41	47.619	19.05	54.725	38.70
Sec δ , Tan δ	1.469	-1.077	1.051	+0.322	1.038	-0.278	4.131	+4.008
$D\psi\alpha$, $D\omega\alpha$	+0.037	-0.038	+0.068	+0.011	+0.055	-0.010	+0.151	+0.143
$D\psi\delta$, $D\omega\delta$	-0.21	+0.85	-0.21	+0.85	-0.21	+0.84	-0.21	+0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cancr. Mag. 3.8		31 Lynceis. Mag. 4.4		δ^1 Cancr. Mag. 5.9		ϵ Argus. Mag. 1.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 12	° ' " + 9 25	h m 8 17	° ' " +43 25	h m 8 18	° ' " +18 34	h m 8 20	° ' " -59 15
	s	"	s	"	s	"	s	"
Jan. 0.6	21.563 ¹⁸⁹	15.40 ¹¹²	35.608 ²³³	56.45 ⁹⁰	58.526 ¹⁸⁸	37.77 ⁵⁹	59.104 ¹⁷⁵	41.54 ³⁷¹
10.5	21.732 ¹²⁴	14.28 ⁹³	35.841 ¹⁷⁰	57.35 ¹¹⁴	58.714 ¹³⁸	37.18 ³⁸	59.279 ⁹¹	45.25 ³⁷⁷
20.5	21.856 ⁷²	13.35 ⁷³	36.011 ¹⁰⁵	58.49 ¹³⁵	58.852 ⁸⁵	36.80 ¹⁸	59.370 ³	49.02 ³⁶⁹
30.5	21.928 ²²	12.62 ⁵⁶	36.116 ³³	59.84 ¹⁴⁷	58.937 ³¹	36.62 ¹	59.373 ⁸²	52.71 ³⁵³
Feb. 9.5	21.950 ³⁰	12.06 ³⁵	36.149 ³³	61.31 ¹⁵⁴	58.968 ²¹	36.63 ¹⁸	59.291 ¹⁶²	56.24 ³³⁰
19.4	21.920 ⁷¹	11.71 ¹⁷	36.116 ⁹⁴	62.85 ¹⁵³	58.947 ⁶⁸	36.81 ³¹	59.129 ²³²	59.54 ²⁹⁴
Mar. 1.4	21.849 ¹¹⁰	11.54 ³	36.022 ¹⁴⁷	64.38 ¹⁴⁵	58.879 ¹⁰⁸	37.12 ⁴⁰	58.897 ²⁹³	62.48 ²⁵⁷
11.4	21.739 ¹⁴¹	11.51 ¹¹	35.875 ¹⁸⁹	65.83 ¹²⁹	58.771 ¹³⁰	37.52 ⁴⁶	58.604 ³⁴⁰	65.05 ²¹³
21.4	21.598 ¹⁵⁸	11.62 ²¹	35.686 ²¹⁷	67.12 ¹⁰⁸	58.632 ¹⁶³	37.98 ⁴⁹	58.264 ³⁷⁵	67.18 ¹⁶⁶
31.3	21.440 ¹⁶⁷	11.83 ³¹	35.469 ²³⁵	68.20 ⁸⁴	58.469 ¹⁷²	38.47 ⁴⁸	57.889 ³⁹⁸	68.84 ¹¹⁴
Apr. 10.3	21.273 ¹⁶⁸	12.14 ³⁵	35.234 ²³⁷	69.04 ⁵⁶	58.297 ¹⁷⁵	38.95 ⁴⁶	57.491 ⁴⁰⁷	69.98 ⁶⁴
20.3	21.105 ¹⁶¹	12.49 ⁴²	34.997 ²²⁸	69.60 ³⁰	58.122 ¹⁶⁶	39.41 ¹²	57.084 ⁴⁰³	70.62 ¹¹
30.2	20.944 ¹¹⁵	12.91 ⁴⁷	34.769 ²⁰⁹	69.90 ²	57.956 ¹⁵¹	39.83 ³⁶	56.681 ³⁹¹	70.73 ⁴²
May 10.2	20.799 ¹²⁴	13.38 ⁵⁰	34.560 ¹⁸¹	69.88 ²⁷	57.805 ¹³⁰	40.19 ³²	56.290 ³⁶³	70.31 ⁹²
20.2	20.675 ⁹⁷	13.88 ⁵³	34.379 ¹⁴⁷	69.61 ⁵⁶	57.675 ¹⁰²	40.51 ²⁶	55.927 ³³⁰	69.39 ¹⁴⁰
30.2	20.578 ⁶⁵	14.41 ⁵¹	34.232 ¹⁰⁶	69.05 ⁷⁸	57.573 ⁷²	40.77 ²⁰	55.597 ²⁸⁷	67.99 ¹⁸⁶
June 9.1	20.513 ³⁶	14.05 ⁵⁸	34.126 ⁶³	68.27 ¹⁰⁰	57.501 ⁴⁰	40.97 ¹⁶	55.310 ²³⁸	66.13 ²²⁵
19.1	20.477 ⁴	15.53 ⁵⁷	34.063 ¹⁷	67.27 ¹¹⁸	57.461 ⁷	41.13 ¹¹	55.072 ¹⁸³	63.88 ²⁶¹
29.1	20.473 ²⁹	16.10 ⁵⁸	34.046 ²⁵	66.09 ¹³¹	57.454 ²⁷	41.24 ⁵	54.889 ¹²⁴	61.27 ²⁸⁷
July 9.1	20.502 ⁶⁰	16.68 ⁵¹	34.071 ⁷¹	64.78 ¹⁴³	57.481 ⁵⁹	41.29 ¹	54.765 ⁵⁰	58.40 ³⁰⁷
19.0	20.562 ⁹¹	17.19 ⁴⁸	34.142 ¹¹⁶	63.35 ¹⁵¹	57.540 ⁹¹	41.28 ⁸	54.706 ⁵	55.33 ³¹⁷
29.0	20.653 ¹²⁰	17.67 ³⁹	34.258 ¹⁵³	61.84 ¹⁵⁹	57.631 ¹²²	41.20 ¹⁷	54.711 ⁷⁵	52.16 ³¹⁷
Aug. 8.0	20.773 ¹⁴⁹	18.06 ²⁸	34.411 ¹⁹³	60.25 ¹⁶⁰	57.753 ¹⁴⁹	41.03 ²⁶	54.786 ¹⁴⁰	48.99 ³⁰⁷
17.9	20.922 ¹⁷⁴	18.34 ¹²	34.604 ²³¹	58.65 ¹⁶³	57.902 ¹⁷⁸	40.77 ³⁷	54.926 ²⁰⁸	45.92 ²⁸⁵
27.9	21.096 ¹⁹⁹	18.46 ²	34.835 ²⁶⁴	57.02 ¹⁶¹	58.080 ²⁰⁴	40.40 ⁴⁰	55.134 ²⁷⁰	43.07 ²⁵⁶
Sept. 6.9	21.295 ²²³	18.44 ²²	35.099 ²⁹⁶	55.41 ¹⁵⁹	58.284 ²²⁸	39.91 ⁶³	55.404 ³²⁹	40.51 ²¹⁵
16.9	21.518 ²⁴⁵	18.22 ⁴²	35.395 ³²⁴	53.82 ¹⁵¹	58.512 ²⁵²	39.28 ⁷⁷	55.733 ³⁸²	38.36 ¹⁶⁶
26.8	21.763 ²⁶⁷	17.80 ⁶⁶	35.719 ³⁵³	52.31 ¹⁴⁴	58.764 ²⁷³	38.51 ⁹⁰	56.115 ⁴²¹	36.70 ¹⁰⁸
Oct. 6.8	22.030 ²⁸³	17.14 ⁸⁵	36.072 ³⁷³	50.87 ¹³²	59.037 ²⁷²	37.61 ¹⁰³	56.539 ⁴⁶⁰	35.62 ⁴⁶
16.8	22.313 ²⁹⁶	16.29 ¹⁰³	36.445 ³⁹²	49.55 ¹¹⁶	59.329 ³⁰⁸	36.58 ¹¹²	56.999 ⁴⁸⁰	35.16 ²⁰
26.8	22.609 ³⁰⁶	15.26 ¹²⁰	36.837 ⁴⁰⁴	48.39 ⁹⁶	59.637 ³¹⁸	35.46 ¹²¹	57.479 ⁴⁸⁸	35.36 ⁸⁵
Nov. 5.7	22.915 ³⁰⁸	14.06 ¹³⁴	37.241 ⁴⁰⁷	47.43 ⁷³	59.955 ³²²	34.25 ¹²²	57.967 ⁴⁵⁹	36.21 ¹⁴⁹
15.7	23.223 ³⁰³	12.72 ¹⁴²	37.648 ⁴⁰³	46.70 ²⁰	60.277 ³¹⁹	33.03 ¹¹³	58.447 ⁴¹⁹	37.70 ²⁰⁹
25.7	23.526 ²⁷⁰	11.30 ¹⁴⁵	38.051 ³⁸⁵	46.22 ¹¹	60.596 ²⁸⁷	31.82 ¹⁰⁴	58.906 ³⁶⁶	39.79 ²⁶¹
Dec. 5.6	23.814 ²³⁹	9.85 ¹⁴²	38.436 ³⁶⁰	46.02 ⁴³	60.902 ²¹⁶	30.69 ⁸⁸	59.325 ³⁰⁰	42.40 ³⁰⁶
15.6	24.084 ¹⁹⁹	8.43 ¹³²	38.796 ³²⁰	46.16 ⁷¹	61.189 ²⁵⁵	29.65 ⁸⁹	59.691 ²²⁶	45.46 ³³⁹
25.6	24.323 ¹⁹⁹	7.11 ¹¹⁸	39.116 ²⁷¹	46.59 ⁷¹	61.444 ²¹⁶	28.77 ⁸⁹	59.991 ²²⁶	48.85 ³⁶²
35.6	24.522 ¹⁹⁹	5.93 ¹¹⁸	39.387 ²⁷¹	47.33 ⁷¹	61.660 ²¹⁶	28.08 ⁸⁹	60.217 ²²⁶	52.47 ³⁶²
Mean Place	20.447	26.04	34.371	71.25	57.447	49.66	56.114	40.88
Sec δ , Tan δ	1.014	+0.166	1.377	+0.947	1.055	+0.336	1.957	-1.632
$D\mu\alpha$, $D\omega\alpha$	+0.065	+0.006	+0.082	+0.036	+0.068	+0.013	+0.025	-0.065
$D\mu\delta$, $D\omega\delta$	-0.22	+0.84	-0.22	+0.83	-0.23	+0.82	-0.23	+0.82

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Monocerotis. Mag. 4.0		θ Chamæleontis. Mag. 4.3		α Ursæ Majoris. Mag. 3.5		Groombridge 1450. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 21 s	° ' " - 3 39 "	h m 8 22 s	° ' " -77 14 "	h m 8 23 s	° ' " +60 58 "	h m 8 27 s	° ' " +38 16 "
Jan. 0.6	50.033 ¹⁶⁹	23.71 ¹⁸⁹	65.82 ²⁶	11.39 ³⁶⁸	54.66 ³²	21.20 ¹⁸⁰	56.102 ²³¹	39.33 ⁵⁵
10.5	50.202 ¹²⁴	25.60 ¹⁷³	66.08 ⁸	15.07 ³⁷⁷	54.98 ²⁴	23.00 ²⁰⁵	56.333 ¹⁷³	39.88 ⁸⁰
20.5	50.326 ⁷²	27.33 ¹⁵⁴	66.16 ¹²	18.84 ³⁷⁶	55.22 ¹⁴	25.05 ²²⁵	56.506 ¹¹¹	40.68 ¹⁰⁰
30.5	50.398 ²¹	28.87 ¹³⁴	66.04 ³⁰	22.60 ³⁶¹	55.36 ⁴	27.30 ²³⁵	56.617 ⁴⁷	41.68 ¹¹⁹
Feb. 9.5	50.422 ²⁷	30.21 ¹¹¹	65.74 ⁴⁶	26.24 ³⁴⁵	55.40 ⁶	29.65 ²³⁶	56.664 ¹⁶	42.87 ¹²⁹
19.4	50.395 ⁶⁹	31.32 ⁸⁷	65.28 ⁶²	29.69 ³¹¹	55.34 ¹⁵	32.01 ²²⁵	56.648 ⁷⁵	44.16 ¹³²
Mar. 1.4	50.326 ¹⁰⁵	32.19 ⁶¹	64.66 ⁷⁵	32.83 ²⁷⁹	55.19 ²³	34.26 ²⁰⁷	56.573 ¹²³	45.48 ¹³⁰
11.4	50.221 ¹³⁷	32.80 ⁴⁰	63.91 ⁸⁶	35.62 ²³⁹	54.96 ²⁹	36.33 ¹⁷⁷	56.450 ¹⁶⁵	46.78 ¹¹⁸
21.4	50.084 ¹⁵⁵	33.20 ¹⁸	63.05 ⁹³	38.01 ¹⁹²	54.67 ³³	38.10 ¹⁴⁵	56.285 ¹⁹¹	47.96 ¹⁰⁵
31.3	49.929 ¹⁶⁵	33.38 ⁰	62.12 ¹⁰⁰	39.93 ¹⁴⁶	54.34 ³⁷	39.55 ¹⁰⁸	56.091 ²¹⁰	49.01 ⁸⁶
Apr. 10.3	49.764 ¹⁶⁸	33.38 ²²	61.12 ¹⁰²	41.39 ⁹¹	53.97 ³⁸	40.63 ⁶²	55.881 ²¹⁵	49.87 ⁶⁴
20.3	49.596 ¹⁶²	33.16 ⁴⁰	60.10 ¹⁰²	42.30 ³⁹	53.59 ³⁷	41.25 ¹⁸	55.666 ²⁰⁷	50.51 ⁴⁰
30.2	49.434 ¹⁴⁹	32.76 ⁵⁸	59.08 ¹⁰¹	42.69 ¹⁴	53.22 ³⁴	41.43 ²¹	55.459 ¹⁹³	50.91 ¹⁷
May 10.2	49.285 ¹²⁹	32.18 ⁷²	58.07 ⁹⁶	42.55 ⁷²	52.88 ³¹	41.19 ⁶⁷	55.266 ¹⁶⁸	51.08 ¹⁰
20.2	49.156 ¹⁰⁵	31.46 ⁸⁸	57.11 ⁹⁰	41.83 ¹¹⁸	52.57 ²⁶	40.52 ¹⁰⁷	55.098 ¹³⁷	50.98 ³¹
30.2	49.051 ⁷⁶	30.58 ⁹⁹	56.21 ⁸¹	40.65 ¹⁶⁶	52.31 ²⁷	39.45 ¹⁴⁰	54.961 ¹⁰²	50.67 ⁵³
June 9.1	48.975 ⁴⁹	29.59 ¹¹⁰	55.40 ⁷⁰	38.99 ²¹²	52.11 ¹¹	38.05 ¹⁷¹	54.859 ⁶³	50.14 ⁷¹
19.1	48.926 ¹⁹	28.49 ¹¹⁵	54.70 ⁵⁸	36.87 ²¹⁹	51.97 ⁸	36.34 ¹⁹⁶	54.796 ²⁴	49.40 ⁸⁸
29.1	48.907 ¹²	27.34 ¹²²	54.12 ⁴⁴	31.38 ²⁸⁰	51.89 ⁰	34.38 ²¹⁷	54.772 ¹⁵	48.52 ¹⁰⁴
July 9.1	48.919 ⁴³	26.12 ¹²²	53.68 ²⁸	31.58 ³⁰⁵	51.89 ⁶	32.21 ²³²	54.787 ⁵⁸	47.48 ¹¹⁵
19.0	48.962 ⁷⁴	24.90 ¹²²	53.40 ¹³	28.53 ³¹⁹	51.95 ¹³	29.89 ²⁴⁰	54.845 ⁹⁵	46.33 ¹²⁶
29.0	49.036 ¹⁰³	23.68 ¹⁰⁹	53.27 ¹	25.34 ³²¹	52.08 ²⁰	27.49 ²⁴⁶	54.940 ¹³³	45.07 ¹²³
Aug. 8.0	49.139 ¹³¹	22.59 ⁹⁹	53.31 ²¹	22.10 ³¹⁸	52.28 ²⁵	25.03 ²⁴¹	55.073 ¹⁶⁹	43.74 ¹⁴⁰
17.9	49.270 ¹⁵⁷	21.60 ⁸⁰	53.52 ³⁷	18.92 ³⁰²	52.53 ³¹	22.59 ²⁴¹	55.242 ²⁰²	42.34 ¹⁴¹
27.9	49.427 ¹⁸⁶	20.80 ⁵⁷	53.89 ⁵¹	15.90 ²⁷⁶	52.84 ³⁷	20.18 ²³¹	55.444 ²³⁵	40.90 ¹⁴⁷
Sept. 6.9	49.613 ²¹⁰	20.23 ³²	54.43 ⁶⁷	13.14 ²³⁸	53.21 ⁴¹	17.87 ²¹⁶	55.679 ²⁶⁵	39.43 ¹⁴⁸
16.9	49.823 ²³⁴	19.91 ¹	55.10 ⁸¹	10.76 ¹⁸⁹	53.62 ⁴⁷	15.71 ¹⁹⁹	55.944 ²⁹⁴	37.95 ¹⁴⁷
26.8	50.057 ²⁵⁴	19.90 ³¹	55.91 ⁹⁰	8.87 ¹³⁵	54.09 ⁴⁹	13.72 ¹⁷⁶	56.238 ³²⁰	36.48 ¹⁴⁶
Oct. 6.8	50.311 ²⁷¹	20.21 ⁶⁴	56.81 ⁹⁸	7.52 ⁷⁵	54.58 ⁵⁴	11.96 ¹⁴⁹	56.558 ³¹¹	35.02 ¹³⁷
16.8	50.585 ²⁸⁹	20.85 ⁹⁵	57.79 ¹⁰²	6.77 ¹¹	55.12 ⁵⁶	10.47 ¹¹⁸	56.902 ³⁶³	33.65 ¹²⁷
26.8	50.874 ²³⁸	21.80 ¹²⁷	58.81 ¹⁰³	6.66 ⁶⁰	55.68 ⁵⁷	9.29 ⁸¹	57.265 ³⁷⁶	32.38 ¹¹⁴
Nov. 5.7	51.172 ³⁰²	23.07 ¹⁵¹	59.84 ¹⁰⁰	7.26 ¹²²	56.25 ⁵⁸	8.45 ⁴¹	57.641 ³⁸¹	31.24 ⁹⁴
15.7	51.474 ²⁹⁹	24.58 ¹⁷⁴	60.84 ⁹⁴	8.48 ¹⁸⁴	56.83 ⁵⁷	8.01 ⁴	58.022 ³⁷⁹	30.30 ⁷⁴
25.7	51.773 ²⁸⁶	26.32 ¹⁸⁸	61.78 ⁸³	10.32 ²⁴²	57.40 ⁵⁵	7.97 ³⁷	58.401 ³⁶⁸	29.56 ⁴⁸
Dec. 5.6	52.059 ²⁶⁵	28.20 ¹⁹⁷	62.61 ⁷⁰	12.74 ²⁸⁸	57.95 ⁵¹	8.34 ⁸¹	58.769 ³¹³	29.08 ²³
15.6	52.324 ²³⁵	30.17 ¹⁹⁹	63.31 ⁵⁵	15.62 ³²⁶	58.46 ⁴⁵	9.15 ¹²¹	59.112 ³¹⁰	28.85 ⁹
25.6	52.559 ²⁰⁰	32.16 ¹⁹¹	63.86 ³⁷	18.88 ³⁵⁵	58.91 ³⁸	10.39 ¹⁵⁸	59.422 ²⁶⁶	28.94 ³⁸
35.6	52.759	34.07	64.23	22.43	59.29	11.97	59.688	29.32
Mean Place	48.864	15.24	58.588	12.40	52.980	37.57	54.983	53.85
Sec δ , Tan δ	1.002	-0.064	4.528	-4.416	2.061	+1.802	1.274	+0.789
$D\psi\alpha$, $D\omega\alpha$	+0.060	-0.002	-0.034	-0.172	+0.100	+0.071	+0.078	+0.032
$D\psi\delta$, $D\omega\delta$	-0.23	+0.81	-0.23	+0.81	-0.23	+0.81	-0.24	+0.80

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Cancr. Mag. 5.5		Groombridge 1446. Mag. 6.3		δ Hydræ. Mag. 4.2		σ Hydræ. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 28	° ' +20 41	h m 8 31	° ' +73 53	h m 8 33	° ' + 5 58	h m 8 34	° ' + 3 36
	s	"	s	"	s	"	s	"
Jan. 0.6	16.595 ²⁰²	61.20 51	13.83 54	44.99 ²²⁹	35.954 ¹⁸⁸	13.82 ¹³⁹	45.151 ¹⁸⁷	36.69 ¹⁵³
10.6	16.797 ¹⁵⁰	60.69 27	14.37 37	47.28 ²⁵⁸	36.142 ¹⁴²	12.43 ¹²⁰	45.338 ¹⁴¹	35.16 ¹³⁵
20.5	16.947 ⁹⁴	60.42 7	14.74 22	49.86 ²⁷⁷	36.284 ⁹¹	11.23 ¹⁰⁰	45.479 ⁹⁰	33.81 ¹¹⁴
30.5	17.041 ⁴³	60.35 12	14.96 4	52.63 ²⁸⁶	36.375 ⁴⁰	10.23 ⁷⁸	45.569 ⁴⁰	32.67 ⁹⁴
Feb. 9.5	17.084 ¹¹	60.47 29	15.00 11	55.49 ²⁸³	36.415 ¹⁰	9.45 ⁵⁸	45.609 ⁹	31.73 ⁷¹
19.4	17.073 ⁶⁰	60.76 44	14.89 27	58.32 ²⁶⁸	36.405 ⁵⁵	8.87 ³⁶	45.600 ⁵⁵	31.02 ⁵⁰
Mar. 1.4	17.013 ¹⁰⁰	61.20 51	14.62 40	61.00 ²¹³	36.350 ⁹³	8.51 ¹⁹	45.545 ⁹³	30.52 ³⁰
11.4	16.913 ¹³⁷	61.71 56	14.22 53	63.43 ²⁰⁹	36.257 ¹²⁶	8.32 ²	45.452 ¹²⁵	30.22 ¹²
21.4	16.776 ¹⁵⁹	62.27 58	13.69 61	65.52 ¹⁶⁶	36.131 ¹⁴⁷	8.30 ¹²	45.327 ¹⁴⁶	30.10 ⁴
31.3	16.617 ¹⁶⁹	62.85 56	13.08 66	67.18 ¹¹⁸	35.984 ¹⁶⁰	8.42 ²⁵	45.181 ¹⁵⁹	30.14 ¹⁹
Apr. 10.3	16.448 ¹⁷⁶	63.41 52	12.42 69	68.36 ⁶⁷	35.824 ¹⁶⁵	8.67 ³⁴	45.022 ¹⁶³	30.33 ³¹
20.3	16.272 ¹⁶⁹	63.93 45	11.73 69	69.03 ¹³	35.659 ¹⁵⁸	9.01 ⁴³	44.859 ¹⁵⁹	30.64 ⁴²
30.3	16.103 ¹⁵⁵	64.38 39	11.04 66	69.16 ³⁸	35.501 ¹⁴⁷	9.44 ⁵⁰	44.700 ¹⁴⁷	31.06 ⁵¹
May 10.2	15.948 ¹³⁶	64.77 30	10.38 60	68.78 ⁸⁸	35.354 ¹²⁹	9.94 ⁵⁷	44.553 ¹²⁸	31.57 ⁶⁰
20.2	15.812 ¹¹⁰	65.07 20	9.78 52	67.90 ¹³⁷	35.225 ¹⁰⁵	10.51 ⁶²	44.425 ¹⁰⁶	32.17 ⁶⁹
30.2	15.702 ⁷⁸	65.27 17	9.26 44	66.53 ¹⁷⁸	35.120 ⁷⁸	11.13 ⁶⁷	44.319 ⁸⁰	32.86 ⁷³
June 9.1	15.624 ⁴⁹	65.44 8	8.82 32	64.75 ²¹⁴	35.042 ⁵⁰	11.80 ⁶⁹	44.239 ⁵²	33.59 ⁷⁹
19.1	15.575 ¹⁷	65.52 0	8.50 22	62.61 ²⁴³	34.992 ²¹	12.49 ⁷²	44.187 ²²	34.38 ⁸²
29.1	15.558 ²⁰	65.52 9	8.28 10	60.18 ²⁶⁷	34.971 ⁹	13.21 ⁷⁰	44.165 ⁷	35.20 ⁸²
July 9.1	15.578 ⁵⁰	65.43 15	8.18 4	57.51 ²⁸³	34.980 ³⁹	13.91 ⁶⁸	44.172 ³⁷	36.02 ⁸¹
19.0	15.628 ⁸¹	65.28 22	8.22 15	54.68 ²⁹³	35.019 ⁷⁰	14.59 ⁶²	44.209 ⁶⁷	36.83 ⁷⁵
29.0	15.709 ¹¹³	65.06 31	8.37 26	51.75 ²⁹⁶	35.089 ⁹⁶	15.21 ⁵⁴	44.276 ⁹⁴	37.58 ⁶⁷
Aug. 8.0	15.822 ¹⁴³	64.75 12	8.63 39	48.79 ²⁹⁵	35.185 ¹²⁶	15.75 ¹²	44.370 ¹²³	38.25 ⁵⁵
18.0	15.965 ¹⁷²	64.33 54	9.02 48	45.84 ²⁸⁶	35.311 ¹⁵⁴	16.17 ²⁶	44.493 ¹⁵⁰	38.80 ⁴⁰
27.9	16.137 ¹⁹⁹	63.79 66	9.50 58	42.98 ²⁷²	35.465 ¹⁷⁸	16.43 ⁹	44.643 ¹⁷⁷	39.20 ²⁰
Sept. 6.9	16.336 ²²⁶	63.13 75	10.08 68	40.26 ²⁵²	35.643 ²⁰¹	16.52 ¹³	44.820 ²⁰³	39.40 ²
16.9	16.562 ²⁴⁹	62.38 90	10.76 76	37.74 ²²⁷	35.847 ²²³	16.39 ³⁵	45.023 ²²⁷	39.38 ²⁷
26.8	16.811 ²⁷²	61.48 100	11.52 83	35.47 ¹⁹⁶	36.076 ²⁵³	16.04 ⁶²	45.250 ²⁵¹	39.11 ⁵³
Oct. 6.8	17.083 ²⁹⁴	60.48 111	12.35 89	33.51 ¹⁶⁰	36.329 ²⁷²	15.42 ⁸⁴	45.501 ²⁷⁰	38.58 ⁸⁰
16.8	17.377 ³¹⁰	59.34 119	13.24 93	31.91 ¹²¹	36.601 ²⁸⁹	14.58 ¹⁰⁸	45.771 ²⁸⁸	37.78 ¹⁰⁶
26.8	17.687 ³²¹	58.15 123	14.17 96	30.70 ⁷⁷	36.890 ³⁰²	13.50 ¹²³	46.059 ²⁹⁹	36.72 ¹²⁹
Nov. 5.7	18.008 ³²⁷	56.92 127	15.13 96	29.93 ³⁰	37.192 ³⁰⁸	12.21 ¹¹⁵	46.358 ³⁰⁷	35.43 ¹⁴⁷
15.7	18.335 ³²⁶	55.65 121	16.09 95	29.63 ²⁰	37.500 ³⁰⁶	10.76 ¹⁵⁷	46.665 ³⁰⁵	33.96 ¹⁶³
25.7	18.661 ³¹⁸	54.44 111	17.04 90	29.83 ⁷¹	37.806 ²⁹⁸	9.19 ¹⁸³	46.970 ²⁹⁶	32.33 ¹⁷⁰
Dec. 5.7	18.979 ²⁹⁵	53.33 98	17.94 83	30.54 ¹²⁰	38.104 ²⁸⁰	7.56 ¹⁶³	47.266 ²⁷⁹	30.63 ¹⁷³
15.6	19.274 ²⁶⁷	52.35 84	18.77 74	31.74 ¹⁶⁷	38.384 ²⁵¹	5.93 ¹⁵⁷	47.545 ²⁵⁰	28.90 ¹⁶⁷
25.6	19.541 ²²⁶	51.51 63	19.51 63	33.41 ²⁰⁸	38.635 ²¹³	4.36 ¹⁴⁵	47.795 ²¹⁴	27.23 ¹⁵⁷
35.6	19.767	50.88	20.14	35.49	38.848	2.91	48.009	25.66
Mean Place	15.551	73.38	11.094	62.23	34.886	23.59	44.072	46.02
Sec δ , Tan δ	1.069	+0.378	3.605	+3.464	1.005	+0.105	1.002	+0.063
$D\psi\alpha$, $D\omega\alpha$	+0.069	+0.015	+0.134	+0.142	+0.063	+0.004	+0.062	+0.003
$D\psi\delta$, $D\omega\delta$	-0.24	+0.80	-0.24	+0.79	-0.25	+0.78	-0.25	+0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cancri. Mag. 4.7		δ Cancri. Mag. 4.2		α Pyxidis. Mag. 3.7		ϵ Cancri. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 38	° ' +21 44	h m 8 40	° ' +18 25	h m 8 40	° ' -32 54	h m 8 42	° ' +29 2
	s	"	s	"	s	"	s	"
Jan. 0.6	51.015 ²¹¹	34.79 ⁴⁹	19.735 ²⁰⁷	65.86 ⁶⁹	31.449 ¹⁸³	31.67 ³¹⁷	3.556 ²²⁴	19.74 [—]
10.6	51.226 ¹⁶¹	34.30 ²⁴	19.942 ¹⁶⁰	65.17 ⁴⁷	31.632 ¹²⁸	34.84 ³¹⁵	3.780 ¹⁷⁴	19.67 [—]
20.5	51.387 ¹⁰⁸	34.06 ³	20.102 ¹⁰⁶	64.70 ²⁵	31.760 ⁷³	37.99 ³⁰⁶	3.954 ¹¹⁹	19.86 ⁴¹
30.5	51.495 ⁵³	34.03 [—]	20.208 ⁵³	64.45 ³	31.833 ¹⁵	41.05 ²⁸⁶	4.073 ⁵⁹	20.27 ⁶³
Feb. 9.5	51.548 ¹	34.21 ³⁵	20.261 ¹	64.42 ¹⁶	31.848 ³⁸	43.91 ²⁶³	4.132 ³	20.90 ⁸⁰
19.4	51.547 ⁵⁰	34.56 ⁴⁹	20.262 ⁴⁸	64.58 ³⁰	31.810 ⁸⁷	46.54 ²³²	4.135 ⁵⁰	21.70 ⁸⁹
Mar. 1.4	51.497 ⁹³	35.05 ⁵⁹	20.214 ⁸⁹	64.88 ⁴²	31.723 ¹³¹	48.86 ¹⁹⁸	4.085 ⁹⁶	22.59 ⁹⁴
11.4	51.404 ¹²⁹	35.64 ⁶⁴	20.125 ¹²⁶	65.30 ⁵⁰	31.592 ¹⁶⁶	50.84 ¹⁵⁹	3.989 ¹³⁵	23.53 ⁹⁴
21.4	51.275 ¹⁵³	36.28 ⁶⁵	19.999 ¹⁵⁰	65.80 ⁵⁴	31.426 ¹⁹⁰	52.43 ¹²¹	3.854 ¹⁶²	24.47 ⁸⁹
31.3	51.122 ¹⁷⁰	36.93 ⁶²	19.849 ¹⁶³	66.34 ⁵⁴	31.236 ²⁰⁶	53.64 ⁸⁰	3.692 ¹⁷⁹	25.36 ⁷⁹
Apr. 10.3	50.952 ¹⁷¹	37.55 ⁵⁷	19.686 ¹⁶⁹	66.88 ⁵⁴	31.030 ²¹²	54.44 ³⁹	3.513 ¹⁸⁵	26.15 ⁶⁷
20.3	50.778 ¹⁷⁰	38.12 ⁵⁰	19.517 ¹⁶⁶	67.42 ⁴⁸	30.818 ²¹¹	54.83 ³	3.328 ¹⁸²	26.82 ⁵¹
30.3	50.608 ¹⁵⁷	38.62 ⁴¹	19.351 ¹⁵¹	67.90 ⁴¹	30.607 ²⁰⁰	54.80 ⁴³	3.146 ¹⁷⁰	27.33 ³⁸
May 10.2	50.451 ¹³⁹	39.03 ³²	19.197 ¹³¹	68.34 ³⁹	30.407 ¹⁸⁴	54.37 ⁸¹	2.976 ¹⁵¹	27.71 ¹⁸
20.2	50.312 ¹¹⁴	39.35 ²²	19.063 ¹¹⁴	68.73 ³¹	30.223 ¹⁶³	53.56 ¹²⁰	2.825 ¹²⁴	27.89 ⁵
30.2	50.198 ⁸⁶	39.57 ¹³	18.949 ⁸³	69.04 ²⁵	30.060 ¹³⁶	52.36 ¹⁵³	2.701 ⁹⁶	27.94 ¹²
June 9.1	50.112 ⁵⁵	39.70 ⁴	18.866 ⁵⁵	69.29 ¹⁸	29.924 ¹⁰⁹	50.83 ¹⁸⁴	2.605 ⁶³	27.82 ²⁷
19.1	50.057 ²⁴	39.74 ⁴	18.811 ²¹	69.47 ¹¹	29.815 ⁷¹	48.99 ²⁰⁸	2.542 ³⁰	27.55 ⁴⁰
29.1	50.033 ¹⁰	39.70 ¹³	18.787 ⁶	69.58 ³	29.741 ⁴¹	46.91 ²²⁹	2.512 ⁴	27.15 ⁵³
July 9.1	50.043 ¹⁰	39.57 ²³	18.793 ⁴⁰	69.61 ⁴	29.700 ⁵	44.62 ²⁴²	2.516 ⁴⁰	26.62 ⁶⁴
19.0	50.083 ⁷³	39.34 ³¹	18.833 ⁷⁰	69.57 ¹³	29.695 ³⁰	42.20 ²⁴⁸	2.556 ⁷¹	25.98 ⁷⁵
29.0	50.156 ¹⁰³	39.03 ⁴¹	18.903 ¹⁰⁰	69.44 ²¹	29.725 ⁶⁷	39.72 ²⁴⁶	2.630 ¹⁰⁷	25.23 ⁸⁴
Aug. 8.0	50.259 ¹³⁴	38.62 ⁴⁹	19.003 ¹²⁸	69.23 ³²	29.792 ¹⁰⁴	37.26 ²³⁶	2.737 ¹³⁷	24.39 ⁹³
18.0	50.393 ¹⁶²	38.13 ⁶²	19.131 ¹⁵⁸	68.91 ⁴⁵	29.896 ¹³⁹	34.90 ²¹⁷	2.874 ¹⁶⁹	23.46 ¹⁰³
27.9	50.555 ¹⁹⁰	37.51 ⁷⁵	19.289 ¹⁸³	68.46 ⁵⁹	30.035 ¹⁷⁷	32.73 ¹⁸⁸	3.043 ²⁰⁰	22.43 ¹¹³
Sept. 6.9	50.745 ²¹⁸	36.76 ⁸⁶	19.472 ²¹²	67.87 ⁷³	30.212 ²¹¹	30.85 ¹⁵⁴	3.243 ²²⁹	21.30 ¹²¹
16.9	50.963 ²¹³	35.90 ⁹⁹	19.684 ²³⁸	67.14 ⁸⁷	30.423 ²⁴¹	29.31 ¹¹²	3.472 ²⁵⁴	20.09 ¹²⁷
26.8	51.206 ²⁶⁷	34.91 ¹¹⁰	19.922 ²⁶²	66.27 ¹⁰¹	30.667 ²⁷⁴	28.19 ⁶³	3.726 ²⁸³	18.82 ¹³²
Oct. 6.8	51.473 ²⁸⁹	33.81 ¹²⁰	20.184 ²⁸³	65.26 ¹¹⁵	30.941 ³⁰⁰	27.56 ⁹	4.009 ³⁰³	17.50 ¹³⁶
16.8	51.762 ³⁰⁹	32.61 ¹²⁷	20.467 ³⁰³	64.11 ¹²⁷	31.241 ³¹⁸	27.47 ⁴⁵	4.312 ³²⁵	16.14 ¹³⁴
26.8	52.071 ³²²	31.34 ¹³¹	20.770 ³¹⁶	62.84 ¹³³	31.559 ³³¹	27.92 ⁹⁸	4.637 ³⁴¹	14.80 ¹³⁴
Nov. 5.7	52.393 ³³¹	30.03 ¹³¹	21.086 ³²³	61.51 ¹³⁵	31.890 ³³⁷	28.90 ¹⁵²	4.978 ³⁴⁸	13.46 ¹²²
15.7	52.724 ³³⁰	28.72 ¹²⁶	21.409 ³²⁵	60.16 ¹³⁵	32.227 ³³⁰	30.42 ¹⁹⁹	5.326 ³⁵¹	12.24 ¹¹¹
25.7	53.054 ³²²	27.46 ¹¹⁵	21.734 ³¹⁷	58.81 ¹²⁷	32.557 ³¹⁸	32.41 ²⁴⁰	5.677 ³²⁴	11.13 ⁹³
Dec. 5.7	53.376 ³⁰⁴	26.31 ¹⁰²	22.051 ²⁹⁹	57.54 ¹¹⁷	32.875 ²⁹²	34.81 ²⁷⁵	6.017 ³²⁴	10.20 ⁷⁴
15.6	53.680 ²⁷⁷	25.29 ⁸³	22.350 ²⁷²	56.37 ¹⁰⁰	33.167 ²⁵⁷	37.56 ²⁹⁷	6.341 ²⁹⁴	9.46 ⁴⁸
25.6	53.957 ²³⁷	24.46 ⁵⁸	22.622 ²³⁴	55.37 ⁸²	33.424 ²¹⁴	40.53 ³¹²	6.635 ²⁵⁵	8.98 ²³
35.6	54.194	23.88	22.856	54.55	33.638	43.65	6.890	8.75
Mean Place	50.012	47.14	18.735	77.66	29.851	29.08	2.557	33.24
Sec δ , Tan δ	1.077	+0.399	1.054	+0.333	1.191	-0.647	1.144	+0.555
$D\psi\alpha$, $D\omega\alpha$	+0.069	+0.017	+0.068	+0.014	+0.048	-0.028	+0.072	+0.024
$D\psi\delta$, $D\omega\delta$	-0.25	+0.77	-0.26	+0.77	-0.26	+0.76	-0.26	+0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Argus. Mag. 2.0		ϵ Hydræ. Mag. 3.5		σ^2 Cancr. (<i>mean</i>). Mag. 5.5		ζ Hydræ. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 42	° ' " -54 25	h m 8 42	° ' " + 6 41	h m 8 49	° ' " +30 51	h m 8 51	° ' " + 6 14
	s	"	s	"	s	"	s	"
Jan. 0.6	36.955 205	32.57 364	43.050 197	58.61 137	34.058 237	65.54 2	20.553 206	12.71 142
10.6	37.160 132	36.21 371	43.247 151	57.24 119	34.295 184	65.52 27	20.759 157	11.29 124
20.5	37.292 55	39.92 367	43.398 101	56.05 98	34.479 128	65.79 50	20.916 109	10.05 102
30.5	37.347 23	43.59 354	43.499 49	55.07 76	34.607 70	66.29 74	21.025 56	9.03 82
Feb. 9.5	37.324 95	47.13 332	43.548 0	54.31 54	34.677 11	67.03 89	21.081 9	8.21 58
19.5	37.229 161	50.45 304	43.548 47	53.77 34	34.688 43	67.92 101	21.090 39	7.63 38
Mar. 1.4	37.068 218	53.49 209	43.501 87	53.43 15	34.645 91	68.93 105	21.051 79	7.25 18
11.4	36.850 265	56.18 225	43.414 120	53.28 1	34.554 132	69.98 104	20.972 112	7.07 1
21.4	36.585 301	58.43 182	43.294 142	53.29 14	34.422 161	71.02 99	20.860 138	7.06 15
31.3	36.284 323	60.25 134	43.152 156	53.43 28	34.261 178	72.01 88	20.722 152	7.21 26
Apr. 10.3	35.961 338	61.59 83	42.996 161	53.71 36	34.083 187	72.89 73	20.570 158	7.47 35
20.3	35.623 338	62.42 31	42.835 159	54.07 41	33.896 186	73.62 58	20.412 157	7.82 44
30.3	35.285 331	62.76 19	42.676 147	54.51 50	33.710 174	74.20 39	20.255 147	8.26 53
May 10.2	34.954 312	62.57 67	42.529 131	55.01 56	33.536 156	74.59 20	20.108 132	8.79 56
20.2	34.642 288	61.90 117	42.398 109	55.57 60	33.380 132	74.79 3	19.976 111	9.35 62
30.2	34.354 253	60.73 162	42.289 84	56.17 64	33.248 102	74.82 16	19.865 89	9.97 65
June 9.2	34.101 214	59.11 202	42.205 56	56.81 65	33.146 70	74.66 32	19.776 60	10.62 67
19.1	33.887 170	57.09 239	42.149 27	57.46 67	33.076 37	74.34 47	19.716 31	11.29 66
29.1	33.717 120	54.70 267	42.122 2	58.13 65	33.039 3	73.87 60	19.682 5	11.95 67
July 9.1	33.597 70	52.03 290	42.124 32	58.78 62	33.036 32	73.27 75	19.677 23	12.62 63
19.0	33.527 14	49.13 303	42.156 60	59.40 56	33.068 67	72.52 86	19.700 53	13.25 56
29.0	33.513 41	46.10 306	42.216 89	59.96 48	33.135 99	71.66 96	19.753 81	13.81 48
Aug. 8.0	33.557 100	43.04 300	42.305 118	60.44 36	33.234 132	70.70 107	19.834 109	14.29 39
18.0	33.657 160	40.04 283	42.423 144	60.80 20	33.366 164	69.63 117	19.943 137	14.68 20
27.9	33.817 216	37.21 257	42.567 171	61.00 2	33.530 194	68.46 125	20.080 163	14.88 2
Sept. 6.9	34.033 270	34.64 219	42.738 198	61.02 10	33.724 225	67.21 132	20.243 191	14.90 18
16.9	34.303 320	32.45 175	42.936 223	60.83 40	33.949 255	65.89 139	20.434 218	14.72 41
26.9	34.623 364	30.70 120	43.159 248	60.43 66	34.204 280	64.50 143	20.652 213	14.31 66
Oct. 6.8	34.987 401	29.50 62	43.407 268	59.77 89	34.484 306	63.07 144	20.895 264	13.65 88
16.8	35.388 425	28.88 4	43.675 287	58.88 112	34.790 327	61.63 143	21.159 286	12.77 114
26.8	35.813 441	28.92 68	43.962 302	57.76 132	35.117 344	60.20 138	21.445 300	11.63 132
Nov. 5.7	36.254 442	29.60 130	44.264 309	56.44 147	35.461 355	58.82 128	21.745 310	10.31 152
15.7	36.696 431	30.90 192	44.573 310	54.97 158	35.816 357	57.54 113	22.055 310	8.79 161
25.7	37.127 403	32.82 215	44.883 301	53.39 165	36.173 349	56.41 94	22.365 305	7.18 169
Dec. 5.7	37.530 364	35.27 291	45.184 285	51.74 164	36.522 333	55.47 71	22.670 289	5.49 187
15.6	37.894 311	38.18 325	45.469 258	50.10 156	36.855 304	54.76 46	22.959 264	3.82 161
25.6	38.205 247	41.43 333	45.727 223	48.54 145	37.159 267	54.30 15	23.223 230	2.21 160
35.6	38.452	44.96	45.950	47.09	37.426	54.15	23.453	0.71
Mean Place	34.411	33.38	42.017	68.33	33.092	79.37	19.547	22.14
Sec δ , Tan δ	1.719	-1.398	1.007	+0.118	1.165	+0.598	1.006	+0.109
$D\psi\alpha$, $D\omega\alpha$	+0.033	-0.061	+0.064	+0.005	+0.073	+0.027	+0.063	+0.005
$D\psi\delta$, $D\omega\delta$	-0.26	+0.76	-0.26	+0.76	-0.27	+0.74	-0.27	+0.73

APPARENT PLACES OF STARS, 1923.

391

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Ursæ Majoris. Mag. 3.1		α Cancrī. Mag. 4.3		δ^1 Carinæ. Mag. 5.1		κ Ursæ Majoris. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 8 53	° ' +48 20	h m 8 54	° ' +12 9	h m 8 55	° ' -58 55	h m 8 58	° ' +47 27
	s	"	s	"	s	"	s	"
Jan. 0.6	57.754	25.78	17.661	13.33	8.186	52.40	23.681	27.26
10.6	58.048 ²⁹¹	26.70 ⁹²	17.873 ²¹²	12.22 ¹¹¹	8.426 ²⁴⁰	56.04 ³⁶⁴	23.977 ²⁹⁶	28.11 ⁸⁵
20.5	58.277 ²²⁹	27.96 ¹²⁶	18.040 ¹⁶⁷	11.32 ⁹⁰	8.583 ¹⁵⁷	59.79 ³⁷⁵	24.210 ²³³	29.30 ¹¹⁹
30.5	58.437 ¹⁶⁰	29.46 ¹⁵⁰	18.156 ¹¹⁶	10.66 ⁶⁶	8.655 ⁷²	63.54 ³⁷⁵	24.375 ¹⁶⁵	30.76 ¹⁴⁶
Feb. 9.5	58.521 ⁸⁴	31.18 ¹⁷²	18.221 ⁶⁵	10.21 ⁴⁵	8.643 ¹²	67.21 ³⁶⁷	24.465 ⁹⁰	32.44 ¹⁶⁸
19.5	58.532 ¹¹	33.02 ¹⁸⁴	18.233 ¹²	9.97 ²⁴	8.550 ⁹³	70.69 ³⁴⁸	24.483 ¹⁸	34.24 ¹⁸⁰
Mar. 1.4	58.471 ⁶¹	34.88 ¹⁸⁶	18.199 ³⁴	9.93 ⁴	8.382 ¹⁶⁸	73.92 ³²³	24.433 ⁵⁰	36.08 ¹⁸⁴
11.4	58.349 ¹²²	36.71 ¹⁸³	18.122 ⁷⁷	10.07 ¹¹	8.149 ²³³	76.81 ²⁸⁹	24.320 ¹¹³	37.90 ¹⁸²
21.4	58.177 ¹⁷²	38.39 ¹⁶⁸	18.012 ¹¹⁰	10.32 ²⁵	7.862 ²⁸⁷	79.30 ²¹⁹	24.158 ¹⁶²	39.59 ¹⁶⁹
31.4	57.965 ²¹²	39.89 ¹⁵⁰	17.875 ¹³⁷	10.68 ³⁶	7.534 ³²⁸	81.36 ²⁰⁶	23.953 ²⁰⁵	41.10 ¹⁵¹
Apr. 10.3	57.726 ²³⁹	41.10 ¹²¹	17.723 ¹⁵²	11.11 ⁴³	7.174 ³⁶⁰	82.94 ¹⁵⁸	23.721 ²³²	42.35 ¹²⁵
20.3	57.472 ²⁵⁴	42.03 ⁹³	17.564 ¹⁵⁹	11.58 ⁴⁷	6.795 ³⁷⁹	84.02 ¹⁰⁸	23.476 ²⁴⁵	43.32 ⁹⁷
30.3	57.219 ²⁵³	42.62 ⁵⁹	17.406 ¹⁵⁸	12.08 ⁵⁰	6.410 ³⁸⁵	84.57 ⁵⁵	23.229 ²⁴⁷	43.96 ⁶⁴
May 10.2	56.979 ²¹⁰	42.87 ²⁵	17.257 ¹¹⁹	12.59 ⁵¹	6.030 ³⁸⁰	84.61 ⁴	22.992 ²¹⁷	44.27 ³¹
20.2	56.757 ²²²	42.80 ⁷	17.123 ¹³⁴	13.09 ⁵⁰	5.665 ³⁶⁵	84.14 ⁴⁷	22.774 ²¹⁸	44.25 ²
30.2	56.563 ¹⁹⁴	42.37 ⁴³	17.011 ¹¹²	13.58 ⁴⁹	5.323 ³⁴²	83.17 ⁹⁷	22.586 ¹⁸⁸	43.88 ³⁷
June 9.2	56.407 ¹⁵⁶	41.63 ⁷⁴	16.921 ⁹⁰	14.06 ⁴⁸	5.016 ³⁰⁷	81.72 ¹⁴⁵	22.431 ¹⁵⁵	43.21 ⁶⁷
19.1	56.291 ¹¹⁶	40.60 ¹⁰³	16.859 ⁶²	14.50 ⁴¹	4.748 ²⁶⁸	79.82 ¹⁹⁰	22.317 ¹¹⁴	42.24 ⁹⁷
29.1	56.222 ⁶⁹	39.31 ¹²⁹	16.824 ³⁵	14.92 ⁴²	4.527 ²²¹	77.54 ²²⁸	22.245 ⁷²	41.02 ¹²²
July 9.1	56.194 ²⁸	37.84 ¹⁴⁷	16.819 ⁵	15.29 ³⁷	4.356 ¹⁷¹	74.93 ²⁶¹	22.215 ³⁰	39.59 ¹⁴³
19.1	56.213 ¹⁹	36.15 ¹⁶⁹	16.842 ²³	15.59 ³⁰	4.245 ¹¹¹	72.07 ²⁸⁶	22.231 ¹⁶	37.97 ¹⁶²
29.0	56.279 ⁶⁶	34.32 ¹⁸³	16.895 ⁵³	15.81 ²²	4.195 ⁵⁰	69.03 ³⁰⁴	22.291 ⁶⁰	36.18 ¹⁷⁹
Aug. 8.0	56.390 ¹¹¹	32.37 ¹⁹⁵	16.977 ⁸²	15.94 ¹³	4.210 ¹⁵	65.92 ³¹¹	22.396 ¹⁰⁵	34.29 ¹⁸⁹
18.0	56.541 ¹⁵¹	30.35 ²⁰²	17.088 ¹¹¹	15.94 ⁰	4.290 ⁸⁰	62.83 ³⁰⁹	22.542 ¹⁴⁶	32.30 ¹⁹⁹
27.9	56.737 ¹⁹⁶	28.28 ²⁰⁷	17.225 ¹³⁷	15.81 ¹³	4.438 ¹⁴⁸	59.88 ²⁹⁵	22.731 ¹⁸⁹	30.25 ²⁰⁵
Sept. 6.9	56.974 ²³⁷	26.17 ²¹¹	17.391 ¹⁶⁶	15.52 ²⁹	4.653 ²¹⁵	57.16 ²⁷²	22.960 ²²⁹	28.18 ²⁰⁷
16.9	57.252 ²⁷⁸	24.10 ²⁰⁷	17.584 ¹⁹³	15.03 ⁴⁹	4.931 ²⁷⁸	54.79 ²³⁷	23.228 ²⁶⁸	26.12 ²⁰⁶
26.9	57.567 ³¹⁵	22.09 ²⁰¹	17.804 ²²⁰	14.36 ⁶⁷	5.268 ³³⁷	52.85 ¹⁹⁴	23.532 ³⁰⁴	24.09 ²⁰³
Oct. 6.8	57.917 ³⁵⁰	20.19 ¹⁹⁰	18.050 ²⁴⁶	13.50 ⁸⁶	5.658 ³⁹⁰	51.42 ¹⁴³	23.874 ³⁴²	22.16 ¹⁹³
16.8	58.297 ³⁸⁰	18.43 ¹⁷⁶	18.319 ²⁶⁹	12.44 ¹⁰⁶	6.092 ⁴³⁴	50.58 ⁸⁴	24.245 ³⁷¹	20.37 ¹⁷⁹
26.8	58.703 ⁴⁰⁶	16.83 ¹⁶⁰	18.608 ²⁸⁹	11.20 ¹²⁴	6.559 ⁴⁶⁷	50.39 ¹⁹	24.644 ³⁹⁹	18.73 ¹⁶⁴
Nov. 5.8	59.129 ⁴²⁶	15.48 ¹³⁵	18.914 ³⁰⁶	9.84 ¹³⁶	7.045 ⁴⁸⁶	50.84 ⁴⁵	25.065 ⁴²¹	17.32 ¹⁴¹
15.7	59.570 ⁴¹¹	14.40 ¹⁰⁸	19.228 ³¹⁴	8.34 ¹⁵⁰	7.536 ⁴⁹¹	51.95 ¹¹¹	25.497 ⁴³²	16.17 ¹¹⁵
25.7	60.013 ⁴¹³	13.64 ⁷⁶	19.546 ³¹⁸	6.81 ¹⁵³	8.015 ⁴⁷⁹	53.68 ¹⁷³	25.935 ⁴³⁸	15.33 ⁸⁴
Dec. 5.7	60.446 ⁴³³	13.20 ⁴	19.859 ³¹³	5.27 ¹⁵⁴	8.470 ⁴⁵⁵	55.98 ²³⁰	26.365 ⁴³⁰	14.85 ⁴⁸
15.6	60.857 ⁴¹¹	13.17 ³	20.156 ²⁹⁷	3.80 ¹⁴⁷	8.880 ⁴¹⁰	58.79 ²⁸¹	26.775 ⁴¹⁰	14.71 ¹⁴
25.6	61.236 ³⁷⁹	13.50 ³³	20.428 ²⁷²	2.43 ¹³⁷	9.233 ³⁵³	61.97 ³¹⁸	27.153 ³⁷⁸	14.97 ²⁶
35.6	61.566 ³³⁰	14.23 ⁷³	20.667 ²³⁹	1.22 ¹²¹	9.519 ²⁸⁶	65.45 ³⁴⁸	27.485 ³³²	15.61 ⁶⁴
Mean Place	56.681	42.05	16.697	23.85	5.306	54.95	22.649	43.55
Sec δ , Tan δ	1.504	+1.124	1.023	+0.215	1.938	-1.660	1.479	+1.090
$D\psi\alpha$, $D\omega\alpha$	+0.083	+0.052	+0.065	+0.010	+0.029	-0.077	+0.082	+0.051
$D\psi\delta$, $D\omega\delta$	-0.27	+0.73	-0.27	+0.72	-0.28	+0.72	-0.28	+0.71

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cancri. Mag. 5.1		σ^2 Ursæ Majoris. Mag. 4.9		λ Argus. Mag. 2.2		θ Hydræ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 3	° ' +10 58	h m 9 3	° ' +67 26	h m 9 5	° ' -43 7	h m 9 10	° ' + 2 38
	s	"	s	"	s	"	s	"
Jan. 0.6	35.671	33.96	40.11	36.56	11.659	15.69	22.562	15.75
10.6	35.889	32.76	40.58	38.34	11.878	19.08	22.779	14.07
20.6	36.064	31.76	40.95	40.48	12.039	22.55	22.953	12.56
30.5	36.189	31.00	41.20	42.88	12.138	25.98	23.079	11.27
Feb. 9.5	36.262	30.46	41.34	45.49	12.173	29.30	23.155	10.19
	22	31	1	268	25	312	24	84
19.5	36.284	30.15	41.35	48.17	12.148	32.42	23.179	9.35
Mar. 1.4	36.258	30.04	41.24	50.81	12.065	35.25	23.158	8.75
11.4	36.189	30.10	41.02	53.32	11.932	37.78	23.094	8.36
21.4	36.087	30.32	40.72	55.59	11.759	39.92	22.999	8.17
31.4	35.956	30.65	40.34	57.52	11.554	41.65	22.874	8.14
	147	41	44	154	229	130	142	15
Apr. 10.3	35.809	31.06	39.90	59.06	11.325	42.95	22.732	8.29
20.3	35.653	31.53	39.44	60.16	11.082	43.79	22.582	8.57
30.3	35.497	32.04	38.96	60.78	10.836	44.18	22.431	8.98
May 10.3	35.349	32.57	38.50	60.88	10.596	44.11	22.286	9.47
20.2	35.214	33.10	38.06	60.53	10.366	43.59	22.153	10.05
	116	53	40	84	213	97	117	67
30.2	35.098	33.63	37.66	59.69	10.153	42.62	22.036	10.72
June 9.2	35.005	34.14	37.32	58.42	9.966	41.25	21.937	11.47
19.1	34.938	34.63	37.05	56.77	9.804	39.49	21.865	12.23
29.1	34.896	35.09	36.85	54.77	9.676	37.40	21.817	13.01
July 9.1	34.883	35.51	36.73	52.46	9.584	35.04	21.798	13.80
	16	36	4	251	55	257	2	78
19.1	34.899	35.87	36.69	49.95	9.529	32.47	21.800	14.58
29.0	34.942	36.14	36.74	47.23	9.516	29.79	21.835	15.29
Aug. 8.0	35.014	36.32	36.86	44.42	9.544	27.04	21.897	15.93
18.0	35.113	36.37	37.07	41.54	9.617	24.33	21.983	16.44
28.0	35.242	36.28	37.35	38.65	9.733	21.77	22.100	16.85
	157	26	37	282	161	231	145	16
Sept. 6.9	35.399	36.02	37.72	35.83	9.894	19.46	22.245	17.01
16.9	35.583	35.58	38.15	33.11	10.099	17.46	22.421	16.95
26.9	35.795	34.92	38.65	30.55	10.345	15.87	22.623	16.65
Oct. 6.8	36.032	34.07	39.21	28.23	10.633	14.78	22.852	16.09
16.8	36.295	33.01	39.82	26.19	10.952	14.21	23.106	15.24
	284	126	66	172	348	5	276	110
26.8	36.579	31.75	40.48	24.47	11.300	14.26	23.382	14.14
Nov. 5.8	36.882	30.35	41.17	23.13	11.666	14.88	23.678	12.80
15.7	37.196	28.83	41.88	22.22	12.041	16.12	23.986	11.25
25.7	37.514	27.24	42.60	21.78	12.416	17.90	24.299	9.52
Dec. 5.7	37.828	25.63	43.29	21.84	12.777	20.20	24.607	7.68
	300	158	67	55	336	270	297	185
15.6	38.128	24.07	43.96	22.39	13.113	22.90	24.904	5.83
25.6	38.406	22.61	44.57	23.44	13.412	25.94	25.177	4.01
35.6	38.648	21.31	45.10	24.94	13.665	29.23	25.419	2.28
	242	130	53	150	253	329	242	173
Mean Place	34.737	44.10	38.535	54.84	9.789	16.74	21.600	23.94
Sec δ , Tan δ	1.019	+0.194	2.607	+2.408	1.370	-0.937	1.001	+0.046
$D\psi\alpha$, $D\omega\alpha$	+0.065	+0.009	+0.106	+0.115	+0.044	-0.045	+0.062	+0.002
$D\psi\delta$, $D\omega\delta$	-0.29	+0.70	-0.29	+0.70	-0.29	+0.69	-0.29	+0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Argus. Mag. 1.8		83 Cancr. Mag. 6.6		ϵ Argus. Mag. 2.2		40 Lyncis. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 12	° ' -69 23	h m 9 14	° ' +18 1	h m 9 15	° ' -58 57	h m 9 16	° ' +34 42
	s	"	s	"	s	"	s	"
Jan. 0.6	25.95 ³⁵	54.36 ³⁵⁷	42.103 ²³⁷	45.83 ⁸⁸	4.418 ²⁷⁵	1.56 ³⁵⁶	23.011 ²⁶⁷	53.99 ⁶
10.6	26.30 ²²	57.93 ³⁷⁵	42.340 ¹⁹¹	44.95 ⁶²	4.693 ¹⁹⁶	5.12 ³⁷¹	23.278 ²²¹	54.05 ³⁶
20.6	26.52 ¹¹	61.68 ³⁸⁵	42.531 ¹⁴³	44.33 ³⁵	4.889 ¹¹⁴	8.83 ³⁷⁶	23.499 ¹⁶¹	54.41 ⁶⁶
30.5	26.63 ¹	65.53 ³⁸¹	42.674 ⁸⁸	43.98 ¹⁴	5.003 ²⁸	12.59 ³⁷¹	23.660 ¹⁰²	55.07 ⁸⁸
Feb. 9.5	26.62 ¹²	69.34 ³⁷¹	42.762 ³⁵	43.84 ¹¹	5.031 ⁵³	16.30 ³⁵⁶	23.762 ⁴³	55.95 ¹¹¹
19.5	26.50 ²³	73.05 ³⁴⁸	42.797 ¹⁵	43.95 ³⁰	4.978 ¹²⁹	19.86 ³³⁵	23.805 ¹⁹	57.06 ¹²⁶
Mar. 1.4	26.27 ³²	76.53 ³²²	42.782 ⁶⁰	44.25 ⁴⁶	4.849 ¹⁹⁷	23.21 ³⁰⁴	23.786 ⁶⁹	58.32 ¹³³
11.4	25.95 ⁴¹	79.75 ²⁸⁶	42.722 ⁹⁶	44.71 ⁵⁵	4.652 ²⁵⁵	26.25 ²⁶⁷	23.717 ¹¹¹	59.65 ¹³¹
21.4	25.54 ⁴⁸	82.61 ²⁴⁶	42.626 ¹²⁷	45.26 ⁶²	4.397 ³⁰¹	28.92 ²²⁷	23.606 ¹⁵⁰	60.96 ¹²⁵
31.4	25.06 ⁵²	85.07 ¹⁹⁸	42.499 ¹⁴⁶	45.88 ⁶⁶	4.096 ³³⁶	31.19 ¹⁸¹	23.456 ¹⁷⁵	62.21 ¹¹⁵
Apr. 10.3	24.54 ⁵⁶	87.05 ¹⁵¹	42.353 ¹⁵⁶	46.54 ⁶⁵	3.760 ³⁶⁰	33.00 ¹³³	23.281 ¹⁸⁶	63.36 ⁹⁷
20.3	23.98 ⁵⁸	88.56 ⁹⁸	42.197 ¹⁶⁰	47.19 ⁶²	3.400 ³⁷²	34.33 ⁸³	23.095 ¹⁹⁰	64.33 ⁷⁸
30.3	23.40 ⁵⁹	89.54 ⁴⁵	42.037 ¹⁵⁴	47.81 ⁵⁵	3.028 ³⁶⁵	35.16 ³¹	22.905 ¹⁸⁴	65.11 ⁵⁴
May 10.3	22.81 ⁵⁷	89.99 ⁷	41.883 ¹⁴¹	48.36 ⁴⁹	2.656 ³⁷²	35.47 ²¹	22.721 ¹⁷¹	65.65 ³⁴
20.2	22.24 ⁵⁶	89.92 ⁶⁴	41.742 ¹²³	48.85 ⁴¹	2.291 ³⁴⁴	35.26 ⁷²	22.550 ¹⁵³	65.99 ⁷
30.2	21.68 ⁵¹	89.28 ¹¹³	41.619 ¹⁰¹	49.26 ³⁴	1.947 ³¹⁹	34.54 ¹²⁰	22.397 ¹²⁷	66.06 ¹³
June 9.2	21.17 ⁴⁷	88.15 ¹⁶³	41.518 ⁷⁶	49.60 ²⁵	1.628 ²⁸⁶	33.34 ¹⁶⁸	22.270 ⁹⁸	65.93 ³⁸
19.1	20.70 ⁴⁰	86.52 ²⁰⁸	41.442 ⁵²	49.85 ¹⁷	1.342 ²⁴²	31.66 ²⁰⁸	22.172 ⁶³	65.55 ⁵⁶
29.1	20.30 ³⁴	84.44 ²⁴⁶	41.390 ²¹	50.02 ⁵	1.100 ¹⁹⁵	29.58 ²¹¹	22.109 ³²	64.99 ⁷⁷
July 9.1	19.96 ²⁵	81.98 ²⁷⁴	41.369 ⁶	50.07 ⁴	0.905 ¹⁴⁰	27.14 ²⁷²	22.077 ⁰	64.22 ⁹³
19.1	19.71 ¹⁶	79.24 ³⁰⁰	41.375 ³⁶	50.03 ¹⁵	0.765 ⁸⁴	24.42 ²⁹⁴	22.077 ³⁷	63.29 ¹⁰⁹
29.0	19.55 ⁷	76.24 ³¹⁶	41.411 ⁶⁶	49.88 ²⁶	0.681 ²⁰	21.48 ³⁰⁶	22.114 ⁷¹	62.20 ¹²⁴
Aug. 8.0	19.48 ³	73.08 ³¹⁹	41.477 ⁹²	49.62 ³⁹	0.661 ⁴⁵	18.42 ³⁰⁷	22.185 ¹⁰⁵	60.96 ¹³⁴
18.0	19.51 ¹⁴	69.89 ³¹¹	41.569 ¹²³	49.23 ⁵⁴	0.706 ¹¹³	15.35 ²⁹⁹	22.290 ¹³⁶	59.62 ¹⁴⁹
28.0	19.65 ²¹	66.75 ²⁹⁷	41.692 ¹⁵⁰	48.69 ⁶⁸	0.819 ¹⁸¹	12.36 ²⁸⁰	22.426 ¹⁷³	58.13 ¹⁵⁸
Sept. 6.9	19.89 ³⁴	63.78 ²⁶⁸	41.842 ¹⁸²	48.01 ⁸⁴	1.000 ²⁴⁷	9.56 ²⁴⁹	22.599 ²⁰⁵	56.55 ¹⁶⁵
16.9	20.23 ⁴⁴	61.10 ²²⁸	42.024 ²¹⁰	47.17 ¹⁰¹	1.247 ³¹⁰	7.07 ²⁰⁹	22.804 ²¹¹	54.90 ¹⁶⁹
26.9	20.67 ⁵²	58.82 ¹⁸⁰	42.234 ²³⁹	46.16 ¹¹⁶	1.557 ³⁶⁸	4.98 ¹⁶¹	23.045 ²⁶⁹	53.21 ¹⁷⁶
Oct. 6.8	21.19 ⁵⁹	57.02 ¹²²	42.473 ²⁶⁵	45.00 ¹³²	1.925 ⁴¹⁸	3.37 ¹⁰⁵	23.314 ³⁰¹	51.45 ¹⁷⁴
16.8	21.78 ⁶¹	55.80 ⁶³	42.738 ²⁸⁸	43.68 ¹⁴¹	2.343 ⁴⁵⁷	2.32 ⁴²	23.615 ³²⁶	49.71 ¹⁷⁰
26.8	22.42 ⁶⁷	55.17 ⁴	43.026 ³⁰⁹	42.27 ¹⁵¹	2.800 ⁴⁸³	1.90 ²¹	23.941 ³⁵⁰	48.01 ¹⁶²
Nov. 5.8	23.09 ⁶⁹	55.21 ⁷²	43.335 ³²²	40.76 ¹⁵⁶	3.283 ⁴⁹⁷	2.11 ⁸⁹	24.291 ³⁶⁶	46.39 ¹⁴⁹
15.7	23.78 ⁶⁷	55.93 ¹³⁹	43.657 ³²⁸	39.20 ¹⁵⁷	3.780 ⁴⁹¹	3.00 ¹⁵¹	24.657 ³⁷³	44.90 ¹³⁰
25.7	24.45 ⁶³	57.32 ¹⁹⁹	43.985 ³²⁷	37.63 ¹⁴⁸	4.271 ⁴⁷²	4.51 ²⁰⁹	25.030 ³⁶⁹	43.60 ¹⁰⁵
Dec. 5.7	25.08 ⁵⁸	59.31 ²⁵⁴	44.312 ³¹⁷	36.15 ¹³⁸	4.743 ⁴³⁴	6.60 ²⁶²	25.399 ³⁵⁷	42.55 ⁷⁸
15.7	25.66 ⁵⁰	61.85 ³⁰⁰	44.629 ²⁹³	34.77 ¹²⁰	5.177 ³⁸⁴	9.22 ³⁰⁵	25.756 ³³¹	41.77 ⁴⁸
25.6	26.16 ⁴¹	64.85 ³³⁵	44.922 ²⁶³	33.57 ¹⁰⁰	5.561 ³²⁴	12.27 ³⁴²	26.090 ²⁹⁹	41.29 ¹⁸
35.6	26.57	68.20	45.185	32.57	5.885	15.69	26.389	41.11
Mean Place	21.673	59.76	41.249	57.25	1.614	5.93	22.178	68.64
Sec δ , Tan δ	2.843	-2.661	1.052	+0.325	1.939	-1.661	1.216	+0.693
$D\alpha$, $D\omega$	+0.014	-0.132	+0.067	+0.016	+0.032	-0.083	+0.073	+0.035
$D\delta$, $D\omega\delta$	-0.30	+0.67	-0.30	+0.66	-0.30	+0.66	-0.30	+0.66

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pyxid. Mag. 4.9		α Hydræ. Mag. 2.2		\bar{h} Ursæ Majoris. Mag. 3.8		ψ Argus. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 18	° ' -25 38	h m 9 23	° ' - 8 19	h m 9 25	° ' +63 23	h m 9 27	° ' -40 7
	s	"	s	"	s	"	s	"
Jan. 0.6	6.110	16.53	49.263	31.76	29.86	40.01	41.517	43.62
10.6	6.329 ²¹⁹	19.42 ²⁸⁹	49.486 ²²³	33.98 ²²²	30.31 ⁴⁵	41.40 ¹³⁹	41.759 ²⁴²	46.88 ³²⁶
20.6	6.501 ¹⁷²	22.30 ²⁸⁸	49.666 ¹⁸⁰	36.08 ²¹⁰	30.68 ³⁷	43.20 ¹⁸⁰	41.947 ¹⁸⁸	50.23 ³³⁵
30.6	6.622 ¹²¹	25.10 ²⁸⁰	49.798 ¹³²	38.04 ¹⁹⁶	30.95 ²⁷	45.32 ²¹²	42.076 ¹²⁹	53.58 ³³⁵
Feb. 9.5	6.689 ⁶⁷	27.74 ²⁶⁴	49.881 ⁸³	39.79 ¹⁷⁵	31.12 ¹⁷	47.72 ²⁴⁰	42.145 ⁶⁹	56.84 ³²⁶
19.5	6.703 ¹¹	30.17 ²⁴³	49.915 ³⁴	41.29 ¹⁵⁰	31.18 ⁶	50.26 ²⁵⁴	42.155 ¹⁰	59.91 ³⁰⁷
Mar. 1.5	6.667 ³⁶	32.33 ²¹⁶	49.901 ¹⁴	42.54 ¹²⁵	31.14 ⁴	52.84 ²⁵⁸	42.111 ⁴⁴	62.74 ²⁸³
11.4	6.589 ⁷⁸	34.20 ¹⁸⁷	49.846 ⁵⁵	43.54 ¹⁰⁰	31.00 ¹⁴	55.36 ²⁵²	42.015 ⁹⁶	65.29 ²⁵⁵
21.4	6.474 ¹¹⁵	35.74 ¹⁵⁴	49.756 ⁹⁰	44.29 ⁷⁵	30.78 ²²	57.68 ²³²	41.878 ¹³⁷	67.48 ²¹⁹
31.4	6.330 ¹⁴⁴	36.94 ¹²⁰	49.636 ¹²⁰	44.77 ⁴⁸	30.50 ²⁸	59.77 ²⁰⁹	41.704 ¹⁷⁴	69.29 ¹⁸¹
Apr. 10.3	6.166 ¹⁶⁴	37.79 ⁸⁵	49.500 ¹³⁶	45.05 ²⁸	30.15 ³⁵	61.51 ¹⁷¹	41.507 ¹⁹⁷	70.70 ¹⁴¹
20.3	5.991 ¹⁷⁵	38.30 ⁵¹	49.351 ¹⁴⁹	45.05 ⁰	29.78 ³⁷	62.86 ¹³⁵	41.295 ²¹²	71.69 ⁹⁹
30.3	5.813 ¹⁷⁸	38.44 ¹¹	49.198 ¹⁵³	44.85 ²⁰	29.39 ³⁹	63.76 ⁹⁰	41.074 ²²¹	72.23 ⁵⁴
May 10.3	5.637 ¹⁷⁶	38.23 ²¹	49.050 ¹⁴⁸	44.44 ⁴¹	29.00 ³⁹	64.21 ⁴⁵	40.853 ²²¹	72.33 ¹⁰
20.2	5.472 ¹⁶⁵	37.68 ⁵⁵	48.910 ¹⁴⁰	43.84 ⁶⁰	28.62 ³⁸	64.18 ³	40.637 ²¹⁶	72.02 ³¹
30.2	5.321 ¹⁵¹	36.82 ⁸⁶	48.785 ¹²⁵	43.09 ⁷⁵	28.28 ³¹	63.68 ⁵⁰	40.437 ²⁰⁰	71.28 ⁷⁴
June 9.2	5.188 ¹³³	35.65 ¹¹⁷	48.675 ¹¹⁰	42.18 ⁹¹	27.98 ³⁰	62.75 ⁹³	40.256 ¹⁸¹	70.12 ¹¹⁶
19.2	5.078 ¹¹⁰	34.22 ¹⁴³	48.589 ⁸⁶	41.12 ¹⁰⁶	27.73 ²⁵	61.40 ¹³⁵	40.096 ¹⁶⁰	68.60 ¹⁵²
29.1	4.993 ⁸⁵	32.54 ¹⁶⁸	48.528 ⁶¹	39.95 ¹¹⁷	27.54 ¹⁹	59.71 ¹⁶⁹	39.964 ¹³²	66.73 ¹⁸⁷
July 9.1	4.936 ⁵⁷	30.69 ¹⁸⁵	48.487 ⁴¹	38.71 ¹²⁴	27.40 ¹⁴	57.69 ²⁰²	39.860 ¹⁰⁴	64.60 ²¹³
19.1	4.908 ²⁸	28.70 ¹⁹⁹	48.474 ¹³	37.44 ¹²⁷	27.34 ⁶	55.38 ²³¹	39.793 ⁶⁷	62.24 ²³⁶
29.0	4.910 ²	26.63 ²⁰⁷	48.489 ¹⁵	36.17 ¹²⁷	27.34 ⁰	52.89 ²¹⁹	39.760 ³³	59.73 ²⁵¹
Aug. 8.0	4.944 ³⁴	24.55 ²⁰⁸	48.531 ⁴²	34.93 ¹²⁴	27.41 ⁷	50.20 ²⁶⁰	39.765 ⁵	57.13 ²⁸⁰
18.0	5.011 ⁶⁷	22.55 ²⁰⁰	48.600 ⁶⁹	33.81 ¹¹²	27.55 ¹⁴	47.42 ²⁷⁸	39.812 ⁴⁷	54.57 ²⁵⁶
28.0	5.110 ⁹⁹	20.68 ¹⁸⁷	48.700 ¹⁰⁰	32.83 ⁹⁸	27.75 ²⁰	44.58 ²⁸⁴	39.900 ⁸⁸	52.10 ²⁴⁷
Sept. 6.9	5.245 ¹³⁵	19.04 ¹⁶⁴	48.830 ¹³⁰	32.09 ⁷⁴	28.02 ²⁷	41.74 ²⁸⁴	40.030 ¹³⁰	49.84 ²²⁶
16.9	5.414 ¹⁶⁹	17.68 ¹³⁶	48.988 ¹⁵⁸	31.58 ⁵¹	28.35 ³³	38.96 ²⁷⁸	40.206 ¹⁷⁶	47.86 ¹⁹⁸
26.9	5.617 ²⁰³	16.70 ⁹⁸	49.178 ¹⁹⁰	31.34 ²⁴	28.74 ³⁹	36.28 ²⁶⁸	40.422 ²¹⁶	46.26 ¹⁶⁰
Oct. 6.9	5.851 ²³⁴	16.14 ⁵⁶	49.399 ²²¹	31.46 ¹²	29.19 ⁴⁵	33.75 ²⁵³	40.679 ²⁵⁷	45.10 ¹¹⁶
16.8	6.117 ²⁶⁶	16.03 ¹¹	49.643 ²⁴⁴	31.94 ⁴⁸	29.70 ⁵¹	31.46 ²²⁹	40.973 ²⁹⁴	44.46 ⁶⁴
26.8	6.408 ²⁹¹	16.41 ³⁸	49.916 ²⁷³	32.77 ⁸³	30.24 ⁵⁴	29.45 ²⁰¹	41.298 ³²⁵	44.39 ⁷
Nov. 5.8	6.720 ³¹²	17.28 ⁸⁷	50.208 ²⁹²	33.96 ¹¹⁹	30.83 ⁵⁹	27.78 ¹⁶⁷	41.646 ³⁴⁸	44.88 ⁴⁹
15.7	7.044 ³²¹	18.63 ¹³⁵	50.515 ³⁰⁷	35.45 ¹⁴⁹	31.44 ⁶¹	26.50 ¹²⁸	42.011 ³⁶⁵	45.95 ¹⁰⁷
25.7	7.372 ³²⁸	20.41 ¹⁷⁸	50.827 ³¹²	37.24 ¹⁷⁹	32.06 ⁶²	25.65 ⁸⁵	42.378 ³⁶⁷	47.57 ¹⁶²
Dec. 5.7	7.695 ³²³	22.58 ²¹⁷	51.136 ³⁰⁹	39.23 ¹⁹⁹	32.68 ⁶²	25.28 ³⁷	42.740 ³⁴²	49.68 ²¹¹
15.7	8.002 ³⁰⁷	25.07 ²⁴⁹	51.436 ³⁰⁰	41.38 ²¹⁵	33.28 ⁶⁰	25.40 ¹²	43.082 ³⁴²	52.22 ²⁵⁴
25.6	8.283 ²⁸¹	27.77 ²⁷⁰	51.713 ²⁷⁷	43.59 ²²¹	33.84 ⁵⁶	26.04 ⁶⁴	43.394 ³¹²	55.12 ²⁹⁰
35.6	8.527 ²⁴⁴	30.58 ²⁸¹	51.959 ²⁴⁶	45.83 ²²⁴	34.34 ⁵⁰	27.15 ¹¹¹	43.666 ²⁷²	58.25 ³¹³
Mean Place	4.792	15.04	48.242	26.59	28.747	58.61	39.840	45.88
Sec δ , Tan δ	1.109	-0.480	1.011	-0.146	2.233	+1.997	1.308	-0.843
$D\psi\alpha$, $D\omega\alpha$	+0.053	-0.024	+0.059	-0.008	+0.094	+0.104	+0.047	-0.044
$D\psi\delta$, $D\omega\delta$	-0.30	+0.65	-0.31	+0.63	-0.31	+0.62	-0.31	+0.62

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ursæ Majoris. Mag. 4.6		θ Ursæ Majoris. Mag. 3.3		ξ Leonis. Mag. 5.1		10 Leonis Minoris. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 27	° ' +70 9	h m 9 27	° ' +52 1	h m 9 27	° ' +11 38	h m 9 29	° ' +36 43
	s	"	s	"	s	"	s	"
Jan. 0.6	43.67	52.74	43.937	27.80	48.694	19.93	31.510	70.17
10.6	44.24	54.39	44.287	28.65	48.934	18.68	31.797	70.26
20.6	44.70	56.46	44.573	29.88	49.130	17.63	32.034	70.64
30.5	45.05	58.87	44.789	31.43	49.279	16.84	32.215	71.38
Feb. 9.5	45.25	61.54	44.928	33.26	49.377	16.29	32.335	72.37
19.5	45.32	64.31	44.986	35.28	49.422	15.99	32.393	73.60
Mar. 1.5	45.26	67.11	44.969	37.37	49.421	15.90	32.392	74.96
11.4	45.08	69.83	44.882	39.48	49.375	16.00	32.334	76.41
21.4	44.78	72.34	44.732	41.50	49.291	16.27	32.232	77.86
31.4	44.39	74.55	44.530	43.32	49.177	16.66	32.091	79.24
Apr. 10.3	43.92	76.36	44.293	44.91	49.043	17.13	31.923	80.50
20.3	43.41	77.73	44.034	46.18	48.897	17.66	31.737	81.61
30.3	42.88	78.65	43.764	47.12	48.747	18.23	31.544	82.51
May 10.3	42.34	79.04	43.496	47.68	48.600	18.80	31.355	83.16
20.2	41.82	78.92	43.239	47.83	48.463	19.37	31.178	83.54
30.2	41.34	78.30	43.005	47.62	48.342	19.92	31.015	83.70
June 9.2	40.91	77.18	42.804	47.02	48.239	20.44	30.879	83.58
19.2	40.55	75.66	42.637	46.07	48.159	20.92	30.769	83.21
29.1	40.26	73.75	42.511	44.83	48.101	21.35	30.689	82.59
July 9.1	40.05	71.47	42.427	43.26	48.069	21.72	30.643	81.77
19.1	39.93	68.93	42.395	41.48	48.063	22.02	30.629	80.76
29.0	39.90	66.14	42.407	39.47	48.084	22.21	30.651	79.55
Aug. 8.0	39.96	63.20	42.466	37.29	48.134	22.30	30.708	78.20
18.0	40.12	60.16	42.574	34.96	48.210	22.27	30.797	76.67
28.0	40.36	57.09	42.727	32.57	48.314	22.07	30.921	75.04
Sept. 6.9	40.69	54.02	42.926	30.12	48.447	21.71	31.083	73.29
16.9	41.11	51.05	43.173	27.68	48.611	21.16	31.279	71.47
26.9	41.61	48.22	43.465	25.26	48.803	20.41	31.512	69.60
Oct. 6.9	42.19	45.57	43.798	22.92	49.025	19.45	31.776	67.70
16.8	42.83	43.21	44.169	20.71	49.275	18.28	32.072	65.80
26.8	43.53	41.17	44.579	18.72	49.549	16.94	32.400	63.95
Nov. 5.8	44.28	39.53	45.019	16.96	49.846	15.44	32.751	62.20
15.7	45.06	38.31	45.479	15.49	50.158	13.81	33.121	60.60
25.7	45.86	37.59	45.954	14.37	50.479	12.12	33.503	59.22
Dec. 5.7	46.65	37.37	46.422	13.64	50.801	10.43	33.886	58.08
15.7	47.41	37.69	46.878	13.32	51.112	8.79	34.257	57.24
25.6	48.12	38.54	47.307	13.46	51.404	7.25	34.605	56.73
35.6	48.76	39.91	47.694	14.05	51.665	5.89	34.922	56.57
Mean Place	42.288	71.88	43.080	45.23	47.866	29.73	30.754	85.23
Sec δ , Tan δ	2.947	+2.772	1.625	+1.281	1.021	+0.206	1.248	+0.746
$D\psi\alpha$, $D\omega\alpha$	+0.107	+0.146	+0.082	+0.067	+0.065	+0.011	+0.073	+0.039
$D\psi\delta$, $D\omega\delta$	-0.31	+0.62	-0.31	+0.62	-0.31	+0.62	-0.32	+0.61

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. Mag. 3.8		θ Antilæ. Mag. 5.0		ε Leonis. Mag. 3.1		υ Argus. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 37 s	° ' +10 14 "	h m 9 40 s	° ' -27 24 "	h m 9 41 s	° ' +24 7 "	h m 9 45 s	° ' -64 42 "
Jan. 0.6	3.393	27.23	47.391	58.40	29.755	33.57	13.97	44.89
10.6	3.637 ²⁴⁴	25.86 ¹³⁷	47.633 ²⁴²	61.31 ²⁹¹	30.022 ²⁶⁷	32.88 ⁶⁹	14.34 ³⁷	48.29 ³⁴⁰
20.6	3.841 ²⁰⁴	24.72 ¹¹⁴	47.829 ¹⁹⁶	64.24 ²⁹³	30.245 ²²³	32.47 ⁴¹	14.62 ²⁸	51.94 ³⁸⁵
30.5	3.997 ¹⁵⁶	23.81 ⁹¹	47.974 ¹⁴⁵	67.12 ²⁸⁸	30.418 ¹⁷³	32.40 ⁷	14.81 ¹⁹	55.72 ³⁷⁸
Feb. 9.5	4.103 ¹⁰⁶	23.15 ⁶⁶	48.066 ⁹²	69.88 ²⁷⁶	30.540 ¹²²	32.61 ²¹	14.90 ⁹	59.54 ³⁸²
19.5	4.158 ⁵⁵	22.74 ⁴¹	48.106 ⁴⁰	72.46 ²⁵⁸	30.606 ⁶⁶	33.04 ⁴³	14.90 ⁰	63.29 ³⁷⁵
Mar. 1.5	4.165 ⁷	22.57 ¹⁷	48.094 ¹²	74.79 ²³³	30.619 ¹³	33.71 ⁶⁷	14.80 ¹⁰	66.89 ³⁶⁰
11.4	4.127 ³⁸	22.60 ³	48.039 ⁵⁵	76.83 ²⁰⁴	30.587 ³²	34.53 ⁸²	14.62 ¹⁸	70.26 ³³⁷
21.4	4.051 ⁷⁶	22.80 ²⁰	47.943 ⁹⁶	78.56 ¹⁷³	30.510 ⁷⁷	35.44 ⁹¹	14.37 ²⁵	73.33 ³⁰⁷
31.4	3.946 ¹⁰⁵	23.14 ³⁴	47.816 ¹²⁷	79.96 ¹⁴⁰	30.399 ¹¹¹	36.39 ⁹⁵	14.05 ³²	76.04 ²⁷¹
Apr. 10.4	3.818 ¹²⁸	23.58 ⁴⁴	47.666 ¹⁵⁰	81.00 ¹⁰⁴	30.261 ¹³⁸	37.36 ⁹⁷	13.68 ³⁷	78.32 ²²⁸
20.3	3.677 ¹⁴¹	24.09 ⁵¹	47.501 ¹⁶⁵	81.70 ⁷⁰	30.108 ¹⁵³	38.25 ⁸⁹	13.27 ⁴¹	80.15 ¹⁸³
30.3	3.530 ¹⁴⁷	24.65 ⁵⁶	47.328 ¹⁷³	82.03 ³³	29.951 ¹⁵⁷	39.07 ⁸²	12.84 ⁴³	81.47 ¹³²
May 10.3	3.386 ¹⁴⁴	25.23 ⁵⁸	47.154 ¹⁷⁴	81.99 ⁴	29.792 ¹⁵⁹	39.76 ⁶⁹	12.40 ⁴⁴	82.29 ⁸²
20.2	3.249 ¹³⁷	25.83 ⁶⁰	46.986 ¹⁶⁸	81.60 ³⁹	29.643 ¹⁴⁹	40.35 ⁵⁹	11.95 ⁴⁵	82.57 ²⁸
30.2	3.127 ¹²²	26.41 ⁵⁸	46.827 ¹⁵⁹	80.90 ⁷⁰	29.507 ¹³⁶	40.77 ⁴²	11.51 ⁴⁴	82.34 ²³
June 9.2	3.021 ¹⁰⁶	26.97 ⁵⁶	46.685 ¹⁴²	79.87 ¹⁰³	29.389 ¹¹⁸	41.03 ²⁶	11.09 ⁴²	81.58 ⁷⁶
19.2	2.935 ⁸⁶	27.50 ⁵³	46.562 ¹²³	78.55 ¹³²	29.292 ⁹⁷	41.16 ¹³	11.09 ³⁹	81.58 ¹²⁷
29.1	2.873 ⁶²	27.99 ⁴⁹	46.460 ¹⁰²	77.01 ¹⁵⁴	29.221 ⁷¹	41.11 ⁵	10.70 ³⁴	80.31 ¹⁷³
July 9.1	2.834 ³⁹	28.42 ⁴³	46.383 ⁷⁷	75.27 ¹⁷⁴	29.175 ⁴⁶	40.92 ¹⁹	10.36 ³⁰	78.58 ²¹⁴
19.1	2.821 ¹³	28.78 ³⁶	46.332 ⁵¹	73.33 ¹⁹⁴	29.155 ²⁰	40.58 ³⁴	10.06 ²⁵	76.44 ²⁵¹
29.1	2.834 ¹³	29.05 ²⁷	46.311 ²¹	71.29 ²⁰⁴	29.165 ¹⁰	40.06 ⁵²	9.81 ¹⁷	73.93 ²⁷⁹
Aug. 8.0	2.872 ³⁸	29.21 ¹⁶	46.320 ⁹	69.21 ²⁰⁸	29.205 ⁴⁰	39.41 ⁶⁵	9.64 ¹¹	71.14 ²⁹⁹
18.0	2.939 ⁶⁷	29.23 ²	46.362 ⁴²	67.17 ²⁰⁴	29.274 ⁶⁹	38.60 ⁸¹	9.53 ²	68.15 ³⁰⁶
28.0	3.033 ⁹⁴	29.11 ¹²	46.438 ⁷⁶	65.24 ¹⁹³	29.374 ¹⁰⁰	37.64 ⁹⁶	9.51 ⁵	65.06 ³⁰⁹
38.0	3.157 ¹²¹	28.80 ³¹	46.551 ¹¹³	63.51 ¹⁷³	29.502 ¹²⁸	36.52 ¹¹²	9.56 ¹⁴	61.97 ²⁹⁸
Sept. 6.9	3.157 ¹⁵⁴	28.80 ⁴⁹	46.551 ¹⁴⁸	63.51 ¹⁴⁸	29.502 ¹⁶³	36.52 ¹²⁶	9.70 ²³	58.99 ²⁷⁷
16.9	3.311 ¹⁸¹	28.31 ⁷⁰	46.699 ¹⁸⁵	62.03 ¹¹³	29.665 ¹⁹⁴	35.26 ¹³⁹	9.93 ³¹	56.22 ²⁴²
26.9	3.492 ²¹⁴	27.61 ⁹²	46.884 ²²¹	60.90 ⁷³	29.859 ²²⁶	33.87 ¹⁵²	10.24 ³⁹	53.80 ²⁰¹
Oct. 6.9	3.706 ²⁴²	26.69 ¹¹⁵	47.105 ²³⁴	60.17 ²⁸	30.085 ²⁵⁸	32.35 ¹⁶³	10.63 ⁴⁶	51.79 ¹⁴⁸
16.8	3.948 ²⁶⁹	25.54 ¹³⁴	47.359 ²⁸⁵	59.89 ²¹	30.343 ²⁸⁶	30.72 ¹⁶⁹	11.09 ⁵¹	50.31 ⁹⁰
26.8	4.217 ²⁹²	24.20 ¹⁵¹	47.644 ³⁰⁸	60.10 ⁷⁰	30.629 ³⁰⁷	29.03 ¹⁷²	11.60 ⁵⁶	49.41 ²⁷
Nov. 5.8	4.509 ³¹⁰	22.69 ¹⁶⁵	47.952 ³²⁶	60.80 ¹¹⁸	30.936 ³³¹	27.31 ¹⁷³	12.16 ⁵⁸	49.14 ³⁹
15.8	4.819 ³¹⁹	21.04 ¹⁷³	48.278 ³³⁵	61.98 ¹⁶⁶	31.267 ³⁴¹	25.58 ¹⁶⁵	12.74 ⁵⁸	49.53 ¹⁰⁶
25.7	5.138 ³²²	19.31 ¹⁷⁵	48.613 ³³³	63.64 ²⁰⁵	31.608 ³⁴⁴	23.93 ¹⁵⁴	13.32 ⁵⁴	50.59 ¹⁶⁸
Dec. 5.7	5.460 ³¹³	17.56 ¹⁷²	48.946 ³²³	65.69 ²⁴¹	31.952 ³³⁷	22.39 ¹³³	13.90 ⁵⁸	52.27 ²²⁷
15.7	5.773 ²⁹⁵	15.84 ¹⁶²	49.269 ²⁹⁸	68.10 ²⁶⁵	32.289 ³²⁰	21.06 ¹¹²	14.44 ⁴⁹	54.54 ²⁷⁶
25.6	6.068 ²⁸⁷	14.22 ¹⁴⁷	49.567 ²⁶⁷	70.75 ²⁸³	32.609 ²⁹⁰	19.94 ⁸⁴	14.93 ⁴¹	57.30 ³¹⁷
35.6	6.335	12.75	49.834	73.58	32.899	19.10	15.34	60.47
Mean Place	2.597	36.48	46.120	58.79	29.053	45.98	10.693	52.85
Sec δ, Tan δ	1.016	+0.181	1.127	-0.519	1.096	+0.448	2.342	-2.117
Dψα, Dωα	+0.064	+0.010	+0.053	-0.028	+0.068	+0.025	+0.030	-0.117
Dψδ, Dωδ	-0.32	+0.58	-0.33	+0.57	-0.33	+0.57	-0.33	+0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Ursæ Majoris. Mag. 3.9		6 Sextantis. Mag. 6.0		μ Leonis. Mag. 4.1		Groombridge 1586. Mag. 6.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 45	° ' +59 23	h m 9 47	° ' - 3 52	h m 9 48	° ' +26 21	h m 9 51	° ' +73 14
	s	"	s	"	s	"	s	"
Jan. 0.6	32.545	47.87	22.158	59.68	23.907	60.38	33.25	27.73
10.6	32.978 ⁴³³	48.88 ¹⁰¹	22.401 ²⁴³	61.73 ²⁰⁵	24.183 ²⁷⁶	59.77 ⁶¹	33.96 ⁷¹	29.24 ¹⁵¹
20.6	33.339 ³⁶¹	50.33 ¹⁴⁵	22.604 ²⁰³	63.67 ¹⁹⁴	24.418 ²³⁵	59.48 ²⁹	34.55 ⁵⁹	31.21 ¹⁹⁷
30.6	33.618 ²⁷⁹	52.17 ¹⁸⁴	22.763 ¹⁵⁹	65.40 ¹⁷³	24.602 ¹⁸⁴	59.50 ²	35.01 ⁴⁶	33.59 ²³⁸
Feb. 9.5	33.808 ¹⁹⁰	54.30 ²¹³	22.871 ¹⁰⁸	66.94 ¹⁵⁴	24.732 ¹³⁰	59.82 ³²	35.32 ³¹	36.25 ²⁶⁶
	99	236	59	128	75	57	15	286
19.5	33.907	56.66	22.930	68.22	24.807	60.39	35.47	39.11
Mar. 1.5	33.913 ⁶	59.11 ²⁴⁵	22.942 ¹²	69.26 ¹⁰⁴	24.828 ²¹	61.18 ⁷⁹	35.47 ⁰	42.04 ²⁹³
11.4	33.832 ⁸¹	61.57 ²⁴⁶	22.911 ³¹	70.07 ⁸¹	24.799 ²⁹	62.13 ⁹⁵	35.32 ¹⁵	44.93 ²⁸⁹
21.4	33.675 ¹⁵⁷	63.92 ²³⁵	22.845 ⁶⁶	70.62 ⁵⁵	24.725 ⁷⁴	63.17 ¹⁰⁴	35.02 ³⁰	47.66 ²⁷³
31.4	33.451 ²²⁴	66.08 ²¹⁶	22.747 ⁹⁸	70.96 ³⁴	24.617 ¹⁰⁸	64.24 ¹⁰⁷	34.61 ⁴¹	50.09 ²⁴³
	272	188	121	12	134	106	50	209
Apr. 10.4	33.179	67.96	22.626	71.08	24.483	65.30	34.11	52.18
20.3	32.869 ³¹⁰	69.49 ¹⁵³	22.491 ¹³⁵	71.01 ⁷	24.330 ¹⁵³	66.29 ⁹⁹	33.53 ⁵⁸	53.84 ¹⁶⁶
30.3	32.541 ³²⁸	70.64 ¹¹⁵	22.351 ¹⁴⁰	70.75 ²⁶	24.170 ¹⁶⁰	67.18 ⁸⁹	32.91 ⁶²	55.02 ¹¹⁸
May 10.3	32.207 ³³⁴	71.33 ⁶⁹	22.209 ¹⁴²	70.34 ⁴¹	24.008 ¹⁶²	67.93 ⁷⁵	32.27 ⁶⁴	55.65 ⁶³
20.2	31.884 ³²³	71.59 ²⁶	22.074 ¹³⁵	69.78 ⁵⁶	23.853 ¹⁵⁵	68.53 ⁶⁰	31.64 ⁶³	55.78 ¹³
	304	18	125	68	141	42	60	41
30.2	31.580	71.41	21.949	69.10	23.712	68.95	31.04	55.37
June 9.2	31.307 ²⁷³	70.79 ⁶²	21.840 ¹⁰⁹	68.30 ⁸⁰	23.588 ¹²⁴	69.19 ²⁴	30.48 ⁵⁶	54.46 ⁹¹
19.2	31.073 ²³⁴	69.75 ¹⁰⁴	21.746 ⁹⁴	67.42 ⁸⁸	23.485 ¹⁰³	69.26 ⁷	29.99 ⁴⁹	53.07 ¹³⁹
29.1	30.883 ¹⁹⁰	68.35 ¹⁴⁰	21.675 ⁷¹	66.48 ⁹⁴	23.408 ⁷⁷	69.15 ¹¹	29.58 ⁴¹	51.24 ¹⁸³
July 9.1	30.745 ¹³⁸	66.59 ¹⁷⁶	21.623 ⁵²	65.48 ¹⁰⁰	23.355 ⁵³	68.86 ²⁹	29.25 ³³	49.01 ²²³
	85	204	28	101	25	45	23	253
19.1	30.660 ²⁹	64.55 ²²⁹	21.595 ¹	64.47 ⁹⁹	23.330 ²	68.41 ⁶²	29.02 ¹²	46.48 ²⁸²
29.1	30.631 ²⁶	62.26 ²⁵¹	21.594 ²²	63.48 ⁹⁴	23.332 ³³	67.79 ⁷⁹	28.90 ²	43.66 ³⁰³
Aug. 8.0	30.657 ⁸⁶	59.75 ²⁶⁵	21.616 ⁵⁰	62.54 ⁸²	23.365 ⁶²	67.00 ⁹⁴	28.88 ⁹	40.63 ³¹⁶
18.0	30.743 ¹⁴³	57.10 ²⁷⁷	21.666 ⁷⁹	61.72 ⁶⁹	23.427 ⁹²	66.06 ¹¹¹	28.97 ¹⁹	37.47 ³²⁶
28.0	30.886 ²⁰⁰	54.33 ²⁸¹	21.745 ¹⁰⁸	61.03 ⁴⁹	23.519 ¹²⁵	64.95 ¹²⁵	29.16 ³⁰	34.21 ³²⁷
Sept. 6.9	31.086	51.52	21.853	60.54	23.644	63.70	29.46	30.94
16.9	31.344 ²⁵⁸	48.71 ²⁸¹	21.991 ¹³⁸	60.27 ²⁷	23.801 ¹⁵⁷	62.31 ¹³⁹	29.86 ⁴⁰	27.72 ³²²
26.9	31.658 ³¹⁴	45.94 ²⁷⁷	22.161 ¹⁷⁰	60.29 ²	23.990 ¹⁸⁹	60.78 ¹⁵³	30.37 ⁵¹	24.62 ³¹⁰
Oct. 6.9	32.025 ³⁶⁷	43.29 ²⁶⁵	22.363 ²⁰²	60.59 ³⁰	24.213 ²²³	59.13 ¹⁶⁵	30.97 ⁶⁰	21.71 ²⁹¹
16.8	32.442 ⁴¹⁷	40.80 ²⁴⁹	22.594 ²³¹	61.22 ⁶³	24.468 ²⁵⁵	57.40 ¹⁷³	31.66 ⁶⁹	19.02 ²⁶⁹
	466	224	259	94	284	179	76	233
26.8	32.908	38.56	22.853	62.16	24.752	55.61	32.42	16.69
Nov. 5.8	33.412 ⁵⁰⁴	36.60 ¹⁹⁶	23.137 ²⁸⁴	63.41 ¹²⁵	25.064 ³¹²	53.81 ¹⁸⁰	33.25 ⁸³	14.72 ¹⁹⁷
15.8	33.947 ⁵³⁵	34.98 ¹⁶²	23.440 ³⁰³	64.93 ¹⁵²	25.396 ³³²	52.04 ¹⁷⁷	34.13 ⁸⁸	13.20 ¹⁵²
25.7	34.498 ⁵⁵¹	33.79 ¹¹⁹	23.752 ³¹²	66.70 ¹⁷⁷	25.741 ³⁴⁵	50.36 ¹⁶⁸	35.04 ⁹¹	12.17 ¹⁰³
Dec. 5.7	35.056 ⁵⁵⁸	33.03 ⁷⁸	24.069 ³¹⁷	68.64 ¹⁹⁴	26.092 ³⁵¹	48.82 ¹⁵⁴	35.96 ⁹²	11.68 ⁴⁹
	545	26	307	207	345	133	89	6
15.7	35.601	32.75	24.376	70.71	26.437	47.49	36.85	11.74
25.6	36.118 ⁵¹⁷	32.97 ²²	24.668 ²⁹²	72.82 ²¹¹	26.765 ³²⁸	46.41 ¹⁰⁸	37.70 ⁸⁵	12.39 ⁶⁵
35.6	36.590 ⁴⁷²	33.69 ⁷²	24.933 ²⁶⁵	74.91 ²⁰⁹	27.066 ³⁰¹	45.62 ⁷⁹	38.48 ⁷⁸	13.57 ¹¹⁸
Mean Place	31.763	66.48	21.283	54.40	23.252	73.26	32.113	47.60
Sec δ , Tan δ	1.964	+1.691	1.002	-0.068	1.116	+0.496	3.469	+3.321
$D\psi\alpha$, $D\omega\alpha$	+0.086	+0.094	+0.060	-0.004	+0.068	+0.028	+0.108	+0.188
$D\psi\delta$, $D\omega\delta$	-0.33	+0.55	-0.33	+0.55	-0.33	+0.54	-0.34	+0.53

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	19 Leonis Minoris. Mag. 5.2		ϕ Argus. Mag. 3.7		π Leonis. Mag. 4.9		η Leonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 9 52	° ' +41 24	h m 9 54	° ' -54 11	h m 9 56	° ' + 8 24	h m 10 3	° ' +17 7
	s "	"	s "	"	s "	"	s "	"
Jan. 0.6	59.100	67.33	11.602	56.73	9.468	43.20	8.751	69.21
10.6	59.423 ³²³	67.44 ¹¹	11.918 ³¹⁶	60.04 ³³¹	9.727 ²⁵⁹	41.66 ¹⁵⁴	9.024 ²⁷³	68.08 ¹¹³
20.6	59.699 ²⁷⁶	67.93 ⁴⁹	12.170 ²⁵²	63.58 ³⁵⁴	9.944 ²¹⁷	40.36 ¹³⁰	9.256 ²³²	67.20 ⁸⁸
30.6	59.917 ²¹⁸	68.81 ⁸⁸	12.351 ¹⁸¹	67.22 ³⁶⁴	10.115 ¹⁷²	39.31 ¹⁰⁵	9.442 ¹⁸⁶	66.63 ⁵⁷
Feb. 9.5	60.072 ¹⁵⁵	70.00 ¹¹⁹	12.459 ¹⁰⁸	70.88 ³⁶⁶	10.240 ¹²⁴	38.49 ⁸²	9.581 ¹³⁹	66.32 ³¹
	91	144	34	356	75	55	85	1
19.5	60.163	71.44	12.493	74.44	10.315	37.94	9.666	66.31
Mar. 1.5	60.189 ²⁶	73.08 ¹⁶⁴	12.458 ³⁵	77.84 ³⁴⁰	10.340 ²⁵	37.60 ³⁴	9.702 ³⁶	66.54 ²³
11.4	60.156 ³³	74.81 ¹⁷³	12.357 ¹⁰¹	81.00 ³¹⁶	10.321 ¹⁹	37.52 ⁸	9.690 ¹²	66.96 ⁴²
21.4	60.069 ⁸⁷	76.56 ¹⁷⁵	12.201 ¹⁵⁶	83.86 ²⁸⁶	10.264 ⁵⁷	37.64 ¹²	9.636 ⁵⁴	67.55 ⁵⁹
31.4	59.938 ¹³¹	78.24 ¹⁶⁸	11.998 ²⁰³	86.36 ²⁵⁰	10.176 ⁸⁸	37.92 ²⁸	9.550 ⁸⁶	68.25 ⁷⁰
	165	156	242	210	115	33	113	76
Apr. 10.4	59.773	79.80	11.756	88.46	10.061	38.30	9.437	69.01
20.3	59.585 ¹⁸⁸	81.16 ¹³⁶	11.485 ²⁷¹	90.11 ¹⁶⁵	9.930 ¹³¹	38.79 ⁴⁹	9.305 ¹³²	69.81 ⁸⁰
30.3	59.385 ²⁰⁰	82.28 ¹¹²	11.197 ²⁸⁸	91.29 ¹¹⁸	9.793 ¹³⁷	39.35 ⁵⁶	9.164 ¹⁴¹	70.58 ⁷⁷
May 10.3	59.182 ²⁰³	83.11 ⁸³	10.899 ²⁹⁸	91.99 ⁷⁰	9.655 ¹³⁸	39.94 ⁵⁹	9.020 ¹⁴¹	71.32 ⁷⁴
20.3	58.985 ¹⁹⁷	83.66 ⁵⁵	10.599 ³⁰⁰	92.19 ²⁰	9.520 ¹³⁵	40.55 ⁶¹	8.880 ¹⁴⁰	71.99 ⁶⁷
	183	22	293	30	125	64	129	58
30.2	58.802	83.88	10.306	91.89	9.395	41.19	8.751	72.57
June 9.2	58.639 ¹⁶³	83.81 ⁷	10.028 ²⁷⁸	91.12 ⁷⁷	9.286 ¹⁰⁹	41.81 ⁶²	8.634 ¹¹⁷	73.06 ⁴⁹
19.2	58.501 ¹²⁵	83.42 ³⁹	9.771 ²⁵⁷	89.87 ¹²⁵	9.193 ⁹³	42.39 ⁵⁸	8.534 ¹⁰⁰	73.45 ³⁹
29.1	58.393 ¹⁰⁸	82.74 ⁶⁸	9.540 ²³¹	88.20 ¹⁶⁷	9.118 ⁷⁵	42.95 ⁵⁶	8.455 ⁷⁹	73.72 ²⁷
July 9.1	58.315 ⁷⁸	81.80 ⁹⁴	9.344 ¹⁹⁶	86.14 ²⁰⁶	9.066 ⁵²	43.44 ⁴⁹	8.397 ⁵⁸	73.86 ¹⁴
	45	119	158	238	29	43	35	2
19.1	58.270	80.61	9.186	83.76	9.037	43.87	8.362	73.88
29.1	58.261 ⁹	79.19 ¹⁴²	9.073 ¹¹³	81.12 ²⁶⁴	9.030 ⁷	44.26 ³⁹	8.352 ¹⁰	73.76 ¹²
Aug. 8.0	58.288 ²⁷	77.57 ¹⁶²	9.010 ⁶³	78.31 ²⁸¹	9.052 ²²	44.49 ²³	8.368 ¹⁶	73.49 ²⁷
18.0	58.350 ⁶²	75.78 ¹⁷⁹	9.000 ¹⁰	75.41 ²⁹⁰	9.098 ⁴⁶	44.58 ⁹	8.412 ⁴⁴	73.07 ⁴²
28.0	58.450 ¹⁰⁰	73.84 ¹⁹⁴	9.048 ⁴⁸	72.52 ²⁸⁹	9.175 ⁷⁷	44.51 ⁷	8.484 ⁷²	72.48 ⁵⁹
	137	205	107	277	103	21	101	75
Sept. 7.0	58.587	71.79	9.155	69.75	9.278	44.30	8.585	71.73
16.9	58.765 ¹⁷⁸	69.63 ²¹⁶	9.324 ¹⁶⁹	67.21 ²⁵⁴	9.412 ¹³⁴	43.86 ⁴⁴	8.719 ¹³⁴	70.78 ⁹⁵
26.9	58.981 ²¹⁶	67.43 ²²⁰	9.552 ²²⁸	65.00 ²²¹	9.579 ¹⁶⁷	43.20 ⁶⁶	8.885 ¹⁶⁶	69.64 ¹¹⁴
Oct. 6.9	59.236 ²⁵⁵	65.20 ²²³	9.840 ²⁸⁸	63.21 ¹⁷⁹	9.776 ¹⁹⁷	42.31 ⁸⁹	9.083 ¹⁹⁸	68.33 ¹³¹
16.8	59.528 ²⁹²	63.00 ²²⁰	10.180 ³⁴⁰	61.91 ¹³⁰	10.006 ²³⁰	41.18 ¹¹³	9.314 ²³¹	66.85 ¹⁴⁸
	327	212	386	71	260	133	261	162
26.8	59.855	60.88	10.566	61.20	10.266	39.85	9.575	65.23
Nov. 5.8	60.213 ³⁵⁸	58.88 ²⁰⁰	10.987 ⁴²¹	61.09 ¹¹	10.548 ²⁸²	38.31 ¹⁵⁴	9.864 ²⁸⁹	63.49 ¹⁷⁴
15.8	60.596 ³⁸³	57.07 ¹⁸¹	11.434 ⁴⁴⁷	61.61 ⁵²	10.852 ³⁰⁴	36.63 ¹⁶⁸	10.175 ³¹¹	61.69 ¹⁸⁰
25.7	60.995 ³⁹⁹	55.51 ¹⁵⁶	11.890 ⁴⁵⁶	62.76 ¹¹⁵	11.167 ³¹⁵	34.83 ¹⁸⁰	10.502 ³²⁷	59.88 ¹⁸¹
Dec. 5.7	61.401 ⁴⁰⁶	54.24 ¹²⁷	12.341 ⁴⁵¹	64.50 ¹⁷⁴	11.489 ³²²	32.98 ¹⁸⁵	10.835 ³³³	58.11 ¹⁷⁷
	399	93	433	228	318	183	331	166
15.7	61.800	53.31	12.774	66.78	11.807	31.15	11.166	56.45
25.7	62.182 ³⁸²	52.77 ⁵⁴	13.171 ³⁹⁷	69.53 ²⁷⁵	12.109 ³⁰²	29.40 ¹⁷⁵	11.483 ³¹⁷	54.93 ¹⁵²
35.6	62.534 ³⁵²	52.62 ¹⁵	13.522 ³⁵¹	72.66 ³¹³	12.388 ²⁷⁹	27.77 ¹⁶³	11.775 ²⁹²	53.65 ¹²⁸
Mean Place	58.498	83.30	9.372	63.80	8.750	51.45	8.129	79.59
Sec δ , Tan δ	1.334	+0.882	1.710	-1.387	1.011	+0.148	1.046	+0.308
$D\alpha\alpha$, $D\omega\alpha$	+0.073	+0.050	+0.042	-0.079	+0.068	+0.008	+0.065	+0.018
$D\psi\delta$, $D\omega\delta$	-0.34	+0.53	-0.34	+0.52	-0.34	+0.51	-0.35	+0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Leonis. (Regulus.) Mag. 1.3		λ Hydræ. Mag. 3.8		η Velorum. Mag. 4.1		ζ Leonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 4	° ' +12 20	h m 10 6	° ' -11 58	h m 10 11	° ' -41 44	h m 10 12	° ' +23 47
	s	"	s	"	s	"	s	"
Jan. 0.6	17.058	29.69	50.943	24.47	31.498	18.19	25.217	53.94
10.6	17.324 ²⁶⁶	28.29 ¹⁴⁰	51.199 ²⁵⁶	26.84 ²³⁷	31.790 ²⁹²	21.29 ³¹⁰	25.506 ²⁸⁹	53.06 ⁸⁸
20.6	17.549 ²²⁵	27.18 ¹¹¹	51.417 ²¹⁸	29.15 ²³¹	32.034 ²⁴⁴	24.55 ³²⁶	25.756 ²⁵⁰	52.51 ⁵⁵
30.6	17.732 ¹⁸³	26.31 ⁸⁷	51.590 ¹⁷³	31.34 ²¹⁹	32.224 ¹⁹⁰	27.88 ³³³	25.960 ²⁰⁴	52.29 ²²
Feb. 9.5	17.867 ¹³⁵	25.73 ⁵⁸	51.714 ¹²⁴	33.37 ²⁰³	32.353 ¹²⁹	31.19 ³³¹	26.113 ¹⁵³	52.37 ⁸
	84	32	76	179	70	323	100	38
19.5	17.951	25.41	51.790	35.16	32.423	34.42	26.213	52.75
Mar. 1.5	17.986 ³⁵	25.32 ⁹	51.818 ²⁸	36.72 ¹⁵⁶	32.437 ¹⁴	37.45 ³⁰³	26.260 ⁴⁷	53.37 ⁶²
11.5	17.975 ¹¹	25.47 ¹⁵	51.801 ¹⁷	38.02 ¹³⁰	32.397 ⁴⁰	40.24 ²⁷⁹	26.256 ⁴	54.19 ⁸²
21.4	17.923 ⁵²	25.80 ³³	51.748 ⁵³	39.05 ¹⁰³	32.311 ⁸⁶	42.75 ²⁵¹	26.210 ⁴⁶	55.15 ⁵⁶
31.4	17.842 ⁸¹	26.28 ⁴⁸	51.662 ⁸⁶	39.82 ⁷⁷	32.183 ¹²⁸	44.93 ²¹⁸	26.126 ⁸⁴	56.19 ¹⁰⁴
	111	54	110	51	159	180	112	106
Apr. 10.4	17.731	26.82	51.552	40.33	32.024	46.73	26.014	57.25
20.3	17.602 ¹²⁹	27.45 ⁶³	51.424 ¹²⁸	40.60 ²⁷	31.841 ¹⁸³	48.15 ¹⁴²	25.880 ¹³⁴	58.29 ¹⁰⁴
30.3	17.465 ¹³⁷	28.13 ⁶⁸	51.287 ¹³⁷	40.61 ¹	31.642 ¹⁹⁹	49.14 ⁹⁹	25.735 ¹⁴⁵	59.26 ⁹⁷
May 10.3	17.327 ¹³⁸	28.80 ⁶⁷	51.146 ¹¹¹	40.41 ²⁰	31.434 ²⁰⁸	49.70 ⁵⁶	25.585 ¹⁵⁰	60.12 ⁸⁶
20.3	17.191 ¹³⁶	29.47 ⁶⁷	51.008 ¹³⁸	39.98 ⁴³	31.224 ²¹⁰	49.83 ¹³	25.437 ¹⁴⁸	60.83 ⁷¹
	127	61	132	62	206	29	138	58
30.2	17.064	30.08	50.876	39.36	31.018	49.54	25.299	61.41
June 9.2	16.950 ¹¹⁴	30.66 ⁵⁸	50.756 ¹²⁰	38.55 ⁸¹	30.822 ¹⁹⁶	48.82 ⁷²	25.173 ¹²⁶	61.82 ⁴¹
19.2	16.850 ¹⁰⁰	31.15 ⁴⁹	50.649 ¹⁰⁷	37.60 ⁹⁵	30.640 ¹⁸²	47.72 ¹¹⁰	25.064 ¹⁰⁹	62.05 ²³
29.2	16.772 ⁷⁸	31.57 ⁴²	50.561 ⁸⁸	36.49 ¹¹¹	30.476 ¹⁶¹	46.24 ¹⁴⁸	24.973 ⁹¹	62.12 ⁷
July 9.1	16.716 ⁵⁶	31.93 ³⁶	50.490 ⁷¹	35.29 ¹²⁰	30.337 ¹³⁹	44.43 ¹⁸¹	24.906 ⁶⁷	61.99 ¹³
	36	26	49	129	114	208	47	28
19.1	16.680	32.19	50.441	34.00	30.223	42.35	24.859	61.71
29.1	16.666 ¹¹	32.32 ¹³	50.416 ²⁵	32.68 ¹³²	30.142 ⁸¹	40.04 ²³¹	24.842 ¹⁷	61.25 ⁴⁶
Aug. 8.0	16.651 ¹⁵	32.33 ¹	50.417 ¹	31.38 ¹³⁰	30.095 ⁴⁷	37.60 ²⁴⁴	24.849 ⁷	60.60 ⁶⁵
18.0	16.721 ⁴⁰	32.18 ¹⁵	50.442 ²⁵	30.16 ¹²²	30.086 ⁹	35.09 ²⁵¹	24.885 ³⁶	59.79 ⁸¹
28.0	16.790 ⁶⁹	31.89 ²⁹	50.499 ⁵⁷	29.05 ¹¹¹	30.120 ³¹	32.61 ²⁴⁸	24.950 ⁶⁵	58.79 ¹⁰⁰
	98	49	86	91	79	237	96	118
Sept. 7.0	16.888	31.40	50.585	28.11	30.199	30.24	25.046	57.61
16.9	17.015 ¹²⁷	30.72 ⁶⁸	50.705 ¹²⁰	27.42 ⁶⁹	30.323 ¹²¹	28.08 ²¹⁶	25.176 ¹³⁰	56.29 ¹³²
26.9	17.177 ¹⁶²	29.84 ⁸⁸	50.857 ¹⁵²	26.98 ⁴⁴	30.496 ¹⁷³	26.24 ¹⁸⁴	25.339 ¹⁶³	54.78 ¹⁵¹
Oct. 6.9	17.369 ¹⁹²	28.74 ¹¹⁰	51.043 ¹⁴⁶	26.91 ⁷	30.716 ²²⁰	24.78 ¹⁴⁶	25.536 ¹⁹⁷	53.14 ¹⁶⁴
16.9	17.595 ²²⁶	27.44 ¹³⁰	51.264 ²²¹	27.17 ²⁶	30.980 ²⁶⁴	23.78 ¹⁰⁰	25.768 ²³²	51.36 ¹⁷⁸
	255	147	252	63	305	49	264	186
26.8	17.850	25.97	51.516	27.80	31.285	23.29	26.032	49.50
Nov. 5.8	18.134 ²⁸⁴	24.34 ¹⁶³	51.795 ²⁷⁹	28.82 ¹⁰²	31.625 ³⁴⁰	23.35 ⁶	26.327 ²⁹⁵	47.59 ¹⁹¹
15.8	18.439 ³⁰⁵	22.58 ¹⁷⁶	52.096 ³⁰¹	30.18 ¹³⁶	31.989 ³⁶⁴	24.00 ⁶⁵	26.646 ³¹⁹	45.68 ¹⁹¹
25.7	18.757 ³¹⁸	20.76 ¹⁸²	52.411 ³¹⁵	31.89 ¹⁷¹	32.367 ³⁷⁸	25.21 ¹²¹	26.984 ³³⁸	43.83 ¹⁸⁵
Dec. 5.7	19.084 ³²⁷	18.93 ¹⁸³	52.731 ³²⁰	33.84 ¹⁹⁵	32.751 ³⁸⁴	26.95 ¹⁷⁴	27.329 ³⁴⁵	42.09 ¹⁷⁴
	323	178	316	218	375	222	345	159
15.7	19.407	17.15	53.047	36.02	33.126	29.17	27.674	40.50
25.7	19.717 ³¹⁰	15.50 ¹⁶⁵	53.348 ³⁰¹	38.32 ²³⁰	33.478 ³⁵²	31.79 ²⁶²	28.006 ³³²	39.16 ¹³⁴
35.6	20.002 ²⁸⁵	13.98 ¹⁵²	53.624 ²⁷⁶	40.66 ²³⁴	33.796 ³¹⁸	34.73 ²⁹⁴	28.316 ³¹⁰	38.11 ¹⁰⁵
Mean Place	16.407	38.76	50.052	22.28	29.967	24.10	24.686	65.86
Sec δ , Tan δ	1.024	+0.219	1.022	-0.212	1.340	-0.892	1.093	+0.441
$D\psi\alpha$, $D\omega\alpha$	+0.064	+0.013	+0.058	-0.012	+0.050	-0.053	+0.066	+0.026
$D\psi\delta$, $D\omega\delta$	-0.35	+0.48	-0.35	+0.47	-0.35	+0.46	-0.35	+0.45

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Ursæ Majoris. Mag. 3.5		32 Ursæ Majoris. Mag. 5.7		γ Leonis <i>pr.</i> Mag. 2.6		μ Ursæ Majoris. Mag. 3.2	
	Right Ascension.		Right Ascension.		Right Ascension.		Right Ascension.	
	Declina- tion.		Declina- tion.		Declina- tion.		Declina- tion.	
	h m 10 12	° ' " +43 17	h m 10 12	° ' " +65 29	h m 10 15	° ' " +20 13	h m 10 17	° ' " +41 52
	s	"	s	"	s	"	s	"
Jan. 0.7	28.130	42.20	28.31	15.98	44.337	42.87	45.370	58.44
10.6	28.476 ³⁴⁶	42.22 ²	28.86 ⁵⁵	16.95 ⁹⁷	44.623 ²⁸⁶	41.81 ¹⁰⁶	45.715 ³⁴⁵	58.35 ⁹
20.6	28.778 ³⁰²	42.67 ⁴⁵	29.32 ⁴⁶	18.43 ¹⁴⁸	44.871 ²⁴⁸	41.05 ⁷⁶	46.017 ³⁰²	58.70 ³⁵
30.6	29.021 ²⁴³	43.55 ⁸⁸	29.71 ³⁹	20.35 ¹⁹²	45.074 ²⁰³	40.59 ⁴⁶	46.264 ²⁴⁷	59.46 ⁷⁶
Feb. 9.5	29.204 ¹⁸³	44.76 ¹²¹	29.99 ²⁸	22.63 ²²⁸	45.227 ¹⁵³	40.44 ¹⁵	46.450 ¹⁸⁶	60.57 ¹¹¹
	118	151	17	255	101	15	122	143
19.5	29.322	46.27	30.16	25.18	45.328	40.59	46.572	62.00
Mar. 1.5	29.373 ⁵¹	47.97 ¹⁷⁰	30.21 ⁵	27.87 ²⁶⁹	45.378 ⁵⁰	40.99 ⁴⁰	46.630 ⁵⁸	63.66 ¹⁶⁶
11.5	29.364 ⁹	49.83 ¹⁸⁶	30.17 ⁴	30.62 ²⁷⁵	45.380 ²	41.60 ⁶¹	46.629 ¹	65.45 ¹⁷⁹
21.4	29.296 ⁶⁸	51.73 ¹⁹⁰	30.02 ¹⁵	33.29 ²⁶⁷	45.338 ⁴²	42.37 ⁷⁷	46.571 ⁵⁸	67.31 ¹⁸⁶
31.4	29.182 ¹¹⁴	53.58 ¹⁸⁵	29.79 ²³	35.77 ²¹⁸	45.260 ⁷⁸	43.24 ⁸⁷	46.466 ¹⁰⁵	69.14 ¹⁸³
	151	174	30	221	105	93	144	173
Apr. 10.4	29.031	55.32	29.49	37.98	45.155	44.17	46.322	70.87
20.4	28.849 ¹⁸²	56.86 ¹⁵⁴	29.13 ³⁶	39.84 ¹⁸⁶	45.028 ¹²⁷	45.10 ⁹³	46.151 ¹⁷¹	72.43 ¹⁵⁶
30.3	28.651 ¹⁹⁸	58.15 ¹²⁹	28.72 ⁴¹	41.28 ¹⁴⁴	44.890 ¹³⁸	45.99 ⁸⁹	45.961 ¹⁹⁰	73.76 ¹³³
May 10.3	28.444 ²⁰⁷	59.18 ¹⁰³	28.31 ⁴¹	42.26 ⁹⁸	44.747 ¹⁴³	46.82 ⁸³	45.763 ¹⁹⁸	74.82 ¹⁰⁶
20.3	28.239 ²⁰⁵	59.89 ⁷¹	27.90 ⁴¹	42.76 ⁵⁰	44.606 ¹⁴¹	47.53 ⁷¹	45.565 ¹⁹⁸	75.57 ⁷⁵
	194	37	39	1	134	61	188	43
30.2	28.045	60.26	27.51	42.77	44.472	48.14	45.377	76.00
June 9.2	27.869 ¹⁷⁶	60.29 ³	27.13 ³⁸	42.27 ⁵⁰	44.352 ¹²⁰	48.62 ⁴⁸	45.203 ¹⁷⁴	76.11 ¹¹
19.2	27.710 ¹⁵⁹	59.98 ³¹	26.79 ³⁴	41.32 ⁹⁵	44.246 ¹⁰⁶	48.96 ³⁴	45.049 ¹⁵⁴	75.89 ²²
29.2	27.579 ¹³¹	59.37 ⁶¹	26.50 ²⁹	39.94 ¹³⁸	44.157 ⁸⁹	49.14 ¹⁸	44.920 ¹²⁹	75.35 ⁵⁴
July 9.1	27.478 ¹⁰¹	58.44 ⁹³	26.26 ²¹	38.15 ¹⁷⁹	44.090 ⁶⁷	49.18 ⁴	44.818 ¹⁰²	74.51 ⁸⁴
	70	121	18	214	45	12	71	112
19.1	27.408	57.23	26.08	36.01	44.045	49.06	44.747	73.39
29.1	27.370 ³⁸	55.76 ¹¹⁷	25.97 ¹¹	33.57 ²¹⁴	44.025 ²⁰	48.77 ²⁹	44.706 ⁴¹	72.02 ¹³⁷
Aug. 8.0	27.372 ²	54.08 ¹⁶⁸	25.93 ⁴	30.87 ²⁷⁰	44.029 ⁴	48.33 ⁴⁴	44.701 ⁵	70.41 ¹⁶¹
18.0	27.408 ³⁶	52.18 ¹⁹⁰	25.96 ³	27.97 ²⁹⁰	44.062 ³³	47.71 ⁶²	44.730 ²⁹	68.58 ¹⁸³
28.0	27.485 ⁷⁷	50.11 ²⁰⁷	26.06 ¹⁰	24.92 ³⁰⁵	44.123 ⁶¹	46.92 ⁷⁹	44.798 ⁶⁸	66.58 ²⁰⁰
	114	223	17	312	90	96	104	216
Sept. 7.0	27.599	47.88	26.23	21.80	44.213	45.96	44.902	64.42
16.9	27.755 ¹⁵⁶	45.55 ²³³	26.47 ²⁴	18.66 ³¹⁴	44.336 ¹²³	44.80 ¹¹⁶	45.048 ¹¹⁶	62.14 ²²⁸
26.9	27.951 ¹⁹⁶	43.16 ²³⁹	26.78 ³¹	15.55 ³¹¹	44.493 ¹⁵⁷	43.47 ¹³³	45.234 ¹⁸⁶	59.79 ²³⁵
Oct. 6.9	28.190 ²³⁹	40.73 ²⁴³	27.16 ³⁸	12.55 ³⁰⁰	44.683 ¹⁹⁰	41.98 ¹⁴⁹	45.461 ²²⁷	57.38 ²⁴¹
16.9	28.468 ²⁷⁸	38.31 ²⁴²	27.61 ⁴⁵	9.72 ²⁸³	44.908 ²²⁵	40.32 ¹⁶⁶	45.730 ²⁶⁹	54.98 ²⁴⁰
	320	232	53	258	258	177	307	235
26.8	28.788	35.99	28.14	7.14	45.166	38.55	46.037	52.63
Nov. 5.8	29.143 ³⁵⁵	33.80 ²¹⁹	28.72 ⁵⁸	4.86 ²²⁸	45.452 ²⁸⁶	36.69 ¹⁸⁶	46.381 ³⁴⁴	50.41 ²²²
15.8	29.526 ³⁸³	31.80 ²⁰⁰	29.33 ⁶¹	2.95 ¹⁹¹	45.764 ³¹²	34.78 ¹⁹¹	46.753 ³⁷²	48.35 ²⁰⁶
25.7	29.930 ⁴⁰⁴	30.05 ¹⁷⁵	29.98 ⁶⁵	1.48 ¹⁴⁷	46.094 ³³⁰	32.90 ¹⁸⁸	47.149 ³⁹⁶	46.53 ¹⁸²
Dec. 5.7	30.342 ⁴¹²	28.59 ¹⁴⁶	30.64 ⁶⁶	0.50 ⁹⁸	46.433 ³³⁹	31.08 ¹⁸²	47.555 ⁴⁰⁶	45.00 ¹⁵³
	412	107	66	44	339	167	407	116
15.7	30.754	27.52	31.30	0.06	46.772	29.41	47.962	43.84
25.7	31.154 ⁴⁰⁰	26.84 ⁶⁸	31.94 ⁶⁴	0.15 ⁹	47.100 ³²⁸	27.93 ¹⁴⁸	48.356 ³⁹⁴	43.07 ⁷⁷
35.6	31.527 ³⁷³	26.64 ²⁰	32.52 ⁵⁸	0.82 ⁶⁷	47.403 ³⁰³	26.71 ¹²²	48.727 ³⁷¹	42.72 ³⁵
Mean Place	27.672	58.50	27.764	35.55	43.803	53.80	44.951	74.45
Sec δ , Tan δ	1.374	+0.942	2.410	+2.193	1.066	+0.368	1.343	+0.897
$D\psi\alpha$, $D\omega\alpha$	+0.072	+0.056	+0.087	+0.130	+0.065	+0.022	+0.071	+0.054
$D\psi\delta$, $D\omega\delta$	-0.35	+0.45	-0.35	+0.45	-0.36	+0.44	-0.36	+0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 H. Ursæ Majoris. Mag. 4.9		μ Hydræ. Mag. 4.1		31 Leonis Minoris. Mag. 4.4		α Antilæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 18	° ' " +65 56	h m 10 22	° ' " -16 26	h m 10 23	° ' " +37 5	h m 10 23	° ' " -30 40
	s	"	s	"	s	"	s	"
Jan. 0.7	36.76	63.81	22.825	33.73	26.640	53.07	38.721	28.45
10.6	37.32	64.73	23.092	36.23	26.970	52.73	39.003	31.31
20.6	37.82	66.18	23.320	38.70	27.258	52.79	39.245	34.26
30.6	38.21	68.07	23.511	41.11	27.498	53.24	39.437	37.23
Feb. 9.5	38.51	70.34	23.652	43.36	27.681	54.07	39.579	40.14
19.5	38.70	72.88	23.741	45.45	27.805	55.22	39.669	42.91
Mar. 1.5	38.77	75.59	23.785	47.28	27.870	56.59	39.708	45.49
11.5	38.74	78.36	23.782	48.87	27.876	58.14	39.699	47.85
21.4	38.60	81.07	23.744	50.18	27.830	59.79	39.645	49.91
31.4	38.37	83.60	23.668	51.20	27.742	61.46	39.556	51.64
Apr. 10.4	38.07	85.88	23.567	51.99	27.617	63.06	39.439	53.08
20.4	37.72	87.79	23.448	52.46	27.464	64.52	39.298	54.14
30.3	37.32	89.31	23.314	52.67	27.295	65.82	39.143	54.87
May 10.3	36.90	90.36	23.176	52.65	27.116	66.88	38.982	55.23
20.3	36.48	90.93	23.035	52.35	26.938	67.70	38.815	55.24
30.2	36.06	90.99	22.900	51.82	26.767	68.21	38.653	54.88
June 9.2	35.68	90.57	22.774	51.06	26.607	68.45	38.496	54.17
19.2	35.32	89.67	22.658	50.13	26.465	68.40	38.349	53.19
29.2	35.03	88.33	22.557	49.01	26.346	68.09	38.221	51.87
July 9.1	34.77	86.57	22.471	47.72	26.248	67.44	38.110	50.31
19.1	34.57	84.46	22.408	46.35	26.180	66.58	38.018	48.55
29.1	34.44	82.02	22.364	44.90	26.139	65.44	37.956	46.61
Aug. 8.1	34.39	79.33	22.347	43.44	26.132	64.09	37.916	44.56
18.0	34.40	76.40	22.354	42.03	26.153	62.53	37.913	42.51
28.0	34.48	73.34	22.395	40.71	26.212	60.76	37.939	40.49
Sept. 7.0	34.64	70.19	22.466	39.54	26.304	58.83	38.006	38.60
16.9	34.87	67.01	22.570	38.60	26.436	56.76	38.112	36.92
26.9	35.17	63.85	22.709	37.94	26.607	54.59	38.259	35.53
Oct. 6.9	35.55	60.78	22.885	37.59	26.815	52.31	38.444	34.49
16.9	36.00	57.90	23.097	37.62	27.063	50.02	38.673	33.88
26.8	36.51	55.24	23.343	38.05	27.351	47.71	38.939	33.71
Nov. 5.8	37.08	52.88	23.618	38.87	27.671	45.50	39.239	34.05
15.8	37.70	50.90	23.919	40.09	28.023	43.42	39.562	34.88
25.8	38.36	49.35	24.236	41.70	28.392	41.51	39.904	36.23
Dec. 5.7	39.02	48.29	24.562	43.60	28.776	39.86	40.252	38.02
15.7	39.69	47.78	24.888	45.77	29.162	38.50	40.597	40.17
25.7	40.34	47.80	25.198	48.13	29.538	37.50	40.926	42.66
35.6	40.95	48.39	25.484	50.57	29.888	36.93	41.231	45.40
Mean Place	36.299	83.48	21.941	33.63	26.244	68.02	37.572	32.45
Sec δ , Tan δ	2.454	+2.241	1.043	-0.295	1.254	+0.756	1.163	-0.593
$D\psi\alpha$, $D\omega\alpha$	+0.087	+0.135	+0.058	-0.018	+0.069	+0.046	+0.055	-0.036
$D\psi\delta$, $D\omega\delta$	-0.36	+0.43	-0.36	+0.41	-0.36	+0.41	-0.36	+0.41

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	36 Ursæ Majoris. Mag. 4.8		9 H. Draconis. Mag. 5.0		ρ Leonis. Mag. 3.8		33 Sextantis. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 25 s	° ' " +56 21 "	h m 10 28 s	° ' " +76 6 "	h m 10 28 s	° ' " + 9 41 "	h m 10 37 s	° ' " - 1 20 "
Jan. 0.7	43.047	74.79	36.22	16.75	46.072	64.45	29.759	13.93
10.6	43.491	75.25	37.13	17.90	46.351	62.88	30.035	15.96
20.6	43.881	76.22	37.93	19.61	46.596	61.53	30.279	17.83
30.6	44.202	77.64	38.59	21.79	46.799	60.45	30.483	19.52
Feb. 9.6	44.447	79.46	39.08	24.36	46.955	59.64	30.642	20.99
19.5	44.609	81.57	39.40	27.20	47.063	59.11	30.752	22.21
Mar. 1.5	44.688	83.90	39.53	30.21	47.122	58.85	30.817	23.17
11.5	44.686	86.36	39.48	33.25	47.135	58.82	30.836	23.88
21.4	44.606	88.80	39.25	36.19	47.108	59.01	30.816	24.34
31.4	44.462	91.15	38.87	38.96	47.046	59.37	30.764	24.60
Apr. 10.4	44.263	93.31	38.36	41.38	46.957	59.86	30.682	24.64
20.4	44.021	95.21	37.74	43.44	46.847	60.44	30.580	24.50
30.3	43.752	96.76	37.04	45.04	46.723	61.09	30.465	24.22
May 10.3	43.465	97.93	36.29	46.15	46.595	61.77	30.341	23.80
20.3	43.174	98.66	35.52	46.70	46.465	62.46	30.216	23.28
30.3	42.892	98.98	34.75	46.72	46.340	63.13	30.094	22.65
June 9.2	42.625	98.87	34.02	46.18	46.225	63.76	29.978	21.95
19.2	42.385	98.30	33.34	45.11	46.121	64.36	29.871	21.21
29.2	42.174	97.33	32.73	43.58	46.032	64.89	29.777	20.42
July 9.1	42.001	95.98	32.21	41.58	45.962	65.34	29.699	19.62
19.1	41.869	94.28	31.79	39.19	45.909	65.71	29.638	18.82
29.1	41.782	92.27	31.48	36.45	45.878	65.97	29.596	18.05
Aug. 8.1	41.740	89.98	31.30	33.43	45.869	66.10	29.575	17.37
18.0	41.750	87.46	31.23	30.21	45.885	66.10	29.580	16.77
28.0	41.809	84.76	31.29	26.86	45.927	65.92	29.611	16.31
Sept. 7.0	41.922	81.93	31.48	23.37	46.000	65.56	29.670	16.02
17.0	42.091	79.02	31.80	19.90	46.103	65.00	29.761	15.95
26.9	42.313	76.09	32.24	16.47	46.238	64.21	29.885	16.11
Oct. 6.9	42.591	73.18	32.81	13.22	46.409	63.20	30.045	16.56
16.9	42.923	70.37	33.50	10.13	46.613	61.95	30.239	17.30
26.8	43.305	67.71	34.30	7.35	46.850	60.51	30.469	18.32
Nov. 5.8	43.735	65.29	35.19	4.92	47.119	58.86	30.729	19.62
15.8	44.204	63.16	36.17	2.92	47.413	57.07	31.016	21.20
25.8	44.701	61.38	37.20	1.37	47.727	55.18	31.323	22.99
Dec. 5.7	45.216	60.03	38.26	0.41	48.052	53.24	31.642	24.93
15.7	45.734	59.15	39.34	0.04	48.378	51.32	31.962	27.00
25.7	46.239	58.78	40.38	0.23	48.694	49.48	32.276	29.09
35.7	46.712	58.92	41.36	1.06	48.992	47.80	32.570	31.15
Mean Place	42.717	93.32	35.776	37.21	45.526	72.08	29.148	9.99
Sec δ, Tan δ	1.806	+1.504	4.166	+4.043	1.014	+0.171	1.000	-0.023
Dψα, Dωα	+0.077	+0.092	+0.103	+0.249	+0.063	+0.011	+0.061	-0.001
Dψδ, Dωδ	-0.36	+0.40	-0.37	+0.39	-0.37	+0.39	-0.37	+0.35

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Leonis Minoris. Mag. 5.0		θ Argus. Mag. 3.0		42 Leonis Minoris. Mag. 5.4		γ Argus. Var. 1.6-6.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 39	° ' +23 35	h m 10 40	° ' -63 59	h m 10 41	° ' +31 4	h m 10 42	° ' -59 16
	s	"	s	"	s	"	s	"
Jan. 0.7	14.348	19.81 ¹⁰⁵	15.00	16.33	35.568	64.58 ⁷⁶	6.416	34.08 ²⁹⁷
10.6	14.652 ³⁰⁴	18.76 ⁷¹	15.47 ⁴⁷	19.30 ²⁹⁷	35.893 ³²⁵	63.82 ³⁶	6.833 ⁴¹⁷	37.05 ³²⁸
20.6	14.922 ²⁷⁰	18.05 ³⁶	15.86 ³⁹	22.61 ³³¹	36.179 ²⁸⁶	63.46 ²	7.189 ³⁵⁶	40.33 ³⁵⁵
30.6	15.150 ²²⁸	17.69 ⁴	16.17 ³¹	26.17 ³⁵⁶	36.423 ²⁴⁴	63.48 ⁴⁰	7.474 ²⁸⁵	43.88 ³⁶⁴
Feb. 9.6	15.329 ¹⁷⁹	17.65 ³¹	16.39 ²²	29.89 ³⁷²	36.614 ¹⁹¹	63.88 ⁷⁴	7.681 ²⁰⁷	47.52 ³⁶⁹
	127		14	376	138		130	
19.5	15.456 ⁷⁶	17.96 ⁵⁷	16.53 ⁴	33.65 ³⁷¹	36.752 ⁸³	64.62 ¹⁰¹	7.811 ⁵²	51.21 ³⁶³
Mar. 1.5	15.532 ²⁵	18.53 ⁸²	16.57 ⁴	37.36 ³⁶⁰	36.835 ²⁹	65.63 ¹²⁵	7.863 ²²	54.84 ³⁴⁸
11.5	15.557 ²⁰	19.35 ⁹⁸	16.53 ¹²	40.96 ³³⁷	36.864 ⁶¹	66.88 ¹³⁸	7.841 ⁹²	58.32 ³²⁷
21.4	15.537 ⁵⁹	20.33 ¹⁰⁹	16.41 ¹⁹	44.33 ³¹³	36.843 ²³	68.26 ¹⁴⁷	7.749 ¹⁵⁰	61.59 ²⁹⁹
31.4	15.478 ⁸⁹	21.42 ¹¹⁵	16.22 ²⁵	47.46 ²⁷⁷	36.780 ⁹⁸	69.73 ¹⁴⁶	7.599 ²⁰⁵	64.58 ²⁶⁵
Apr. 10.4	15.389	22.57 ¹¹⁴	15.97 ³¹	50.23 ²³⁸	36.682 ¹²³	71.19 ¹⁴¹	7.394 ²¹⁸	67.23 ²²⁷
20.4	15.273 ¹¹⁶	23.71 ¹⁰⁹	15.66 ³⁴	52.61 ¹⁹⁶	36.559 ¹⁴⁴	72.60 ¹²⁹	7.116 ²⁸²	69.50 ¹⁸²
30.3	15.143 ¹³⁰	24.80 ¹⁰⁰	15.32 ³⁷	54.57 ¹⁴⁷	36.415 ¹⁵³	73.89 ¹¹²	6.864 ³⁰⁷	71.32 ¹³⁷
May 10.3	15.003 ¹¹⁰	25.80 ⁸⁶	14.95 ³⁹	56.04 ⁹⁹	36.262 ¹⁵⁷	75.01 ⁹³	6.557 ³²⁵	72.69 ⁸⁹
20.3	14.861 ¹³⁹	26.66 ⁷¹	14.56 ⁴⁰	57.03 ⁴⁷	36.105 ¹⁵⁴	75.94 ⁷¹	6.232 ³³¹	73.58 ³⁸
30.3	14.722	27.37 ⁵⁴	14.16 ⁴¹	57.50 ⁶	35.951 ¹⁴⁵	76.65 ⁴⁷	5.901 ³³²	73.96 ¹⁰
June 9.2	14.592 ¹³⁰	27.91 ³⁶	13.75 ³⁹	57.44 ⁵⁷	35.806 ¹³³	77.12 ²¹	5.569 ³²³	73.86 ⁶⁴
19.2	14.474 ¹¹⁸	28.27 ¹⁶	13.36 ³⁷	56.87 ¹⁰⁶	35.673 ¹¹⁵	77.33 ⁵	5.246 ³⁰⁴	73.22 ¹¹⁰
29.2	14.370 ¹⁰⁴	28.43 ²	12.99 ³⁵	55.81 ¹⁵⁵	35.558 ⁹⁸	77.28 ²⁹	4.942 ²⁸³	72.12 ¹⁵⁴
July 9.1	14.284 ⁶⁵	28.41 ²³	12.64 ³⁰	54.26 ¹⁹⁶	35.460 ⁷⁴	76.99 ⁵⁵	4.659 ²¹⁸	70.58 ¹⁹⁶
19.1	14.219 ⁴³	28.18 ⁴¹	12.34 ²⁶	52.30 ²³⁵	35.386 ⁵²	76.44 ⁷⁷	4.411 ²¹⁰	68.62 ²³⁴
29.1	14.176 ¹⁹	27.77 ⁶²	12.08 ²⁰	49.95 ²⁶³	35.334 ²⁶	75.67 ¹⁰²	4.201 ¹⁶⁰	66.28 ²⁵⁹
Aug. 8.1	14.157 ⁶	27.15 ⁸¹	11.88 ¹³	47.32 ²⁸⁷	35.308 ⁴	74.65 ¹²³	4.041 ¹⁰³	63.69 ²⁷⁹
18.0	14.163 ³⁶	26.34 ¹⁰⁰	11.75 ⁵	44.45 ²⁹⁷	35.312 ³³	73.42 ¹⁴³	3.938 ⁴²	60.90 ²⁹⁰
28.0	14.199 ⁶⁶	25.34 ¹²⁰	11.70 ²	41.48 ³⁰⁰	35.345 ⁶⁷	71.99 ¹⁶³	3.896 ²⁸	58.00 ²⁸⁸
Sept. 7.0	14.265	24.14 ¹³⁹	11.72 ¹¹	38.48 ²⁹⁰	35.412 ¹⁰²	70.36 ¹⁸¹	3.924 ⁹⁹	55.12 ²⁸⁰
17.0	14.363 ⁹⁸	22.75 ¹⁵⁷	11.83 ²⁰	35.58 ²⁷¹	35.514 ¹³⁸	68.55 ¹⁹⁵	4.023 ¹⁷⁷	52.32 ²⁵⁶
26.9	14.497 ¹³⁴	21.18 ¹⁷³	12.03 ²⁸	32.87 ²³⁷	35.652 ¹⁷⁸	66.60 ²⁰⁹	4.200 ²¹⁸	49.76 ²²⁸
Oct 6.9	14.667 ²⁰⁸	19.45 ¹⁸⁷	12.31 ³⁷	30.50 ¹⁹⁷	35.830 ²¹⁷	64.51 ²²⁰	4.448 ³²⁰	47.48 ¹⁸²
16.9	14.875 ²⁴⁴	17.58 ¹⁹⁸	12.68 ⁴⁴	28.53 ¹⁴⁶	36.047 ²⁵⁴	62.31 ²²³	4.768 ³⁸³	45.66 ¹³⁴
26.8	15.119	15.60 ²⁰⁵	13.12 ⁵⁰	27.07 ⁸⁹	36.301 ²⁸⁹	60.08 ²²⁵	5.151 ⁴³⁶	44.32 ⁷⁶
Nov. 5.8	15.395 ³⁰⁶	13.55 ²⁰⁷	13.62 ⁵⁵	26.18 ²⁸	36.590 ³²²	57.83 ²¹⁷	5.587 ⁵⁰⁷	43.56 ¹⁷
15.8	15.701 ³²⁸	11.48 ²⁰³	14.17 ⁵⁸	25.90 ³⁹	36.912 ³⁴⁵	55.66 ²⁰⁹	6.070 ⁴⁸³	43.39 ⁴⁸
25.8	16.029 ³⁴³	9.45 ¹⁹²	14.75 ⁵⁹	26.29 ¹⁰²	37.257 ³⁶²	53.57 ¹⁸⁷	6.577 ⁵¹⁹	43.87 ¹¹⁰
Dec. 5.7	16.372 ³⁴⁸	7.53 ¹⁷⁶	15.34 ⁵⁷	27.31 ¹⁶⁴	37.619 ³⁶⁶	51.70 ¹⁶³	7.096 ⁵¹⁴	44.97 ¹⁷¹
15.7	16.720	5.77 ¹⁵²	15.91 ⁵⁵	28.95 ²²⁰	37.985 ³⁰⁰	50.07 ¹³⁴	7.610 ⁴⁹⁰	46.68 ²²⁴
25.7	17.060 ³⁴⁰	4.25 ¹²⁵	16.46 ⁵⁰	31.15 ²⁶⁸	38.345 ³⁴²	48.73 ⁹⁹	8.100 ⁴⁴⁷	48.92 ²⁷²
35.7	17.384 ³²⁴	3.00	16.96	33.83	38.687	47.74	8.547	51.64
Mean Place	13.973	31.12	12.289	28.90	35.262	77.81	4.166	46.00
Sec δ, Tan δ	1.091	+0.437	2.281	-2.050	1.168	+0.603	1.958	-1.683
Dψα, Dωα	+0.065	+0.027	+0.043	-0.128	+0.067	+0.038	+0.046	-0.106
Dψδ, Dωδ	-0.37	+0.35	-0.37	+0.34	-0.37	+0.34	-0.38	+0.33

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Argus. Mag. 2.8		δ^2 Chamæleontis. Mag. 4.6		ζ Leonis. Mag. 5.3		ν Hydræ. Mag. 3.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 43	° ' s -49 0	h m 10 45	° ' s -80 7	h m 10 45	° ' s +10 56	h m 10 45	° ' s -15 47
	s	"	s	"	s	"	s	"
Jan. 0.7	28.832	38.08	11.81	47.69	13.168	63.12	50.197	23.47
10.6	29.184	41.05	12.84	50.40	13.457	61.53	50.481	25.91
20.6	29.489	44.26	13.72	53.54	13.716	60.19	50.731	28.34
30.6	29.735	47.65	14.40	57.00	13.933	59.13	50.940	30.70
Feb. 9.6	29.920	51.11	14.87	60.70	14.106	58.35	51.104	32.92
19.5	30.040	54.56	15.14	64.53	14.230	57.86	51.221	34.95
Mar. 1.5	30.099	57.90	15.18	68.39	14.308	57.66	51.290	36.78
11.5	30.096	61.08	15.02	72.20	14.338	57.67	51.314	38.34
21.5	30.040	64.00	14.66	75.88	14.327	57.93	51.298	39.66
31.4	29.935	66.65	14.13	79.33	14.280	53.38	51.248	40.71
Apr. 10.4	29.790	68.94	13.44	82.48	14.205	58.96	51.168	41.48
20.4	29.611	70.88	12.59	85.31	14.106	59.64	51.067	42.00
30.3	29.409	72.40	11.64	87.70	13.991	60.36	50.950	42.25
May 10.3	29.188	73.47	10.60	89.63	13.870	61.11	50.823	42.28
20.3	28.955	74.10	9.48	91.07	13.743	61.84	50.692	42.04
30.3	28.717	74.28	8.32	91.96	13.619	62.55	50.562	41.62
June 9.2	28.481	74.00	7.13	92.32	13.500	63.21	50.436	40.96
19.2	28.254	73.28	5.96	92.12	13.392	63.80	50.319	40.12
29.2	28.039	72.11	4.84	91.37	13.295	64.32	50.212	39.11
July 9.2	27.844	70.56	3.79	90.10	13.213	64.73	50.118	37.95
19.1	27.672	68.65	2.84	88.33	13.149	65.08	50.041	36.69
29.1	27.532	66.45	2.02	86.12	13.105	65.27	49.982	35.35
Aug. 8.1	27.425	64.02	1.36	83.54	13.081	65.31	49.944	33.99
18.0	27.364	61.44	0.88	80.68	13.083	65.21	49.932	32.66
28.0	27.347	58.81	0.60	77.60	13.109	64.94	49.949	31.40
Sept. 7.0	27.381	56.20	0.55	74.45	13.167	64.48	49.995	30.29
17.0	27.469	53.73	0.72	71.31	13.253	63.81	50.076	29.37
26.9	27.615	51.48	1.12	68.32	13.375	62.93	50.193	28.72
Oct. 6.9	27.820	49.59	1.74	65.59	13.530	61.82	50.348	28.37
16.9	28.079	48.10	2.58	63.21	13.722	60.50	50.541	28.36
26.9	28.390	47.10	3.59	61.31	13.949	58.96	50.770	28.73
Nov. 5.8	28.745	46.65	4.75	59.96	14.209	57.24	51.034	29.50
15.8	29.138	46.77	6.02	59.22	14.497	55.37	51.325	30.65
25.8	29.554	47.51	7.36	59.15	14.807	53.42	51.639	32.15
Dec. 5.7	29.982	48.82	8.71	59.73	15.130	51.43	51.965	33.97
15.7	30.405	50.67	10.04	60.96	15.459	49.47	52.293	36.07
25.7	30.814	53.01	11.29	62.81	15.782	47.61	52.613	38.34
35.7	31.192	55.74	12.42	65.21	16.087	45.90	52.914	40.74
Mean Place	27.206	48.02	4.551	62.56	12.722	70.57	49.441	24.41
Sec δ , Tan δ	1.525	-1.151	5.838	-5.752	1.018	+0.194	1.039	-0.283
$D\psi\alpha$, $D\omega\alpha$	+0.051	-0.072	+0.012	-0.363	+0.063	+0.012	+0.059	-0.018
$D\psi\delta$, $D\omega\delta$	-0.38	+0.33	-0.38	+0.32	-0.38	+0.32	-0.38	+0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	46 Leonis Minoris. Mag. 3.9		54 Leonis. Mag. 4.5		Antilæ. Mag. 4.7		Groombridge 1706. Mag. 6.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 49 s	° ' " +34 37 "	h m 10 51 s	° ' " +25 9 "	h m 10 53 s	° ' " -36 43 "	h m 10 53 s	° ' " +78 10 "
Jan. 0.7	0.878	35.49 67	27.120	27.46 108	9.023	17.36 279	50.25 111	38.49 90
10.6	1.216 338	34.82 25	27.435 315	26.40 71	9.341 318	20.15 298	51.36 99	39.39 148
20.6	1.519 303	34.57 16	27.716 281	25.69 35	9.622 281	23.13 309	52.35 84	40.87 200
30.6	1.777 258	34.73 16	27.956 240	25.34 3	9.854 232	26.22 308	53.19 67	42.87 278
Feb. 9.6	1.984 207	35.29 56	28.149 193	25.37 35	10.036 182	29.30 301	53.86 48	45.31 301
19.5	2.135 151	36.19 90	28.291 142	25.72 65	10.163 127	32.31 289	54.34 25	48.09 310
Mar. 1.5	2.227 92	37.39 120	28.381 90	26.37 90	10.237 74	35.20 268	54.59 5	51.10 306
11.5	2.265 38	38.82 113	28.421 40	27.27 107	10.261 24	37.88 244	54.64 16	52.20 293
21.5	2.251 14	40.39 157	28.413 8	28.34 121	10.237 24	40.32 216	54.48 53	57.26 286
31.4	2.193 58	42.04 162	28.365 82	29.55 125	10.173 97	42.48 184	54.13 66	62.85 230
Apr. 10.4	2.097 126	43.66 156	28.283 106	30.80 126	10.076 125	44.32 150	53.60 77	65.15 189
20.4	1.971 146	45.22 142	28.177 125	32.06 118	9.951 146	45.82 113	52.94 85	67.04 137
30.3	1.825 158	46.64 121	28.052 138	33.24 108	9.805 160	46.95 77	52.17 90	68.41 85
May 10.3	1.667 165	47.85 100	27.914 140	34.32 95	9.645 171	47.72 38	51.32 92	69.26 30
20.3	1.502 162	48.85 71	27.774 111	35.27 78	9.474 173	48.10 1	50.42 89	69.56 26
30.3	1.340 155	49.59 46	27.633 134	36.05 58	9.301 172	48.11 38	49.50 89	69.30 81
June 9.2	1.185 143	50.05 18	27.499 125	36.63 39	9.129 172	47.73 75	48.61 76	68.49 132
19.2	1.042 128	50.23 12	27.374 110	37.02 18	8.963 166	46.98 109	47.75 89	67.17 181
29.2	0.914 108	50.11 38	27.264 96	37.20 5	8.807 144	45.89 140	46.96 71	65.36 224
July 9.2	0.806 87	49.73 68	27.168 75	37.15 25	8.663 124	44.49 168	46.25 59	63.12 263
19.1	0.719 62	49.05 92	27.093 55	36.90 47	8.539 103	42.81 190	45.66 49	60.49 295
29.1	0.657 35	48.13 119	27.038 32	36.43 69	8.436 76	40.91 208	45.17 35	57.54 320
Aug. 8.1	0.622 7	46.94 142	27.006 6	35.74 89	8.360 46	38.83 217	44.82 22	54.34 341
18.0	0.615 26	45.52 183	27.000 54	34.85 129	8.314 31	36.66 219	44.60 7	50.93 354
28.0	0.641 59	43.88 201	27.022 87	33.74 151	8.304 73	34.47 213	44.54 23	47.39 357
Sept. 7.0	0.700 94	42.05 217	27.076 120	32.45 168	8.335 119	32.34 198	44.61 39	43.80 346
17.0	0.794 135	40.04 228	27.163 160	30.94 184	8.408 166	30.36 174	44.84 54	36.77 331
26.9	0.929 174	37.87 236	27.283 197	29.26 209	8.527 258	28.62 143	45.23 83	33.46 305
Oct. 6.9	1.103 215	35.59 239	27.443 236	27.42 209	8.693 213	27.19 57	45.77 83	30.41 272
16.9	1.318 256	33.23 237	27.640 271	25.44 215	8.906 258	26.16 103	46.45 95	27.69 232
26.9	1.574 294	30.84 229	27.876 302	23.35 210	9.164 331	25.59 45	47.28 105	25.37 184
Nov. 5.8	1.868 325	28.47 213	28.147 328	21.20 201	9.462 369	25.51 8	48.23 120	23.53 130
15.8	2.193 354	26.18 164	28.449 351	19.02 180	9.793 371	25.96 231	49.28 123	22.23 72
25.8	2.547 371	24.05 131	28.777 347	16.92 156	10.149 359	26.93 264	50.43 117	21.51 52
Dec. 5.7	2.918 378	22.12 93	29.122 331	14.91 128	10.518 371	28.40 192	51.63 122	21.41 10
15.7	3.296 374	20.48 131	29.473 347	13.11 156	10.889 359	30.32 231	52.86 122	21.51 10
25.7	3.670 356	19.17 93	29.820 331	11.55 128	11.248 339	32.63 264	54.08 117	21.41 10
35.7	4.026 356	18.24 93	30.151 331	10.27 128	11.587 339	35.27 264	55.25 117	21.93 52
Mean Place	0.646	49.49	26.832	38.91	7.888	24.88	50.490	59.07
Sec δ , Tan δ	1.215	+0.691	1.105	+0.470	1.248	-0.746	4.882	+4.778
$D\psi\alpha$, $D\omega\alpha$	+0.067	+0.044	+0.065	+0.030	+0.055	-0.048	+0.097	+0.306
$D\psi\delta$, $D\omega\delta$	-0.38	+0.30	-0.38	+0.29	-0.38	+0.29	-0.38	+0.29

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Crateris. Mag. 4.2		δ Leonis. Mag. 5.0		β Ursæ Majoris. Mag. 2.4		α Ursæ Majoris. Mag. 2.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 10 56 s	° ' -17 53 "	h m 10 56 s	° ' + 4 1 "	h m 10 57 s	° ' +56 47 "	h m 10 58 s	° ' +62 9 "
Jan. 0.7	1.997	17.07	35.526	47.40	12.411	25.33	59.40	42.10
10.7	2.287	19.53	35.815	45.54	12.885	25.45	59.94	42.40
20.6	2.545	22.02	36.076	43.86	13.314	26.13	60.43	43.24
30.6	2.765	24.45	36.297	42.40	13.681	27.32	60.85	44.64
Feb. 9.6	2.937	26.78	36.477	41.20	13.977	28.94	61.18	46.48
19.5	3.063	28.92	36.609	40.28	14.194	30.96	61.43	48.71
Mar. 1.5	3.141	30.88	36.695	39.64	14.328	33.25	61.58	51.21
11.5	3.175	32.59	36.735	39.24	14.382	35.73	61.64	53.88
21.5	3.168	34.04	36.735	39.09	14.354	38.29	61.61	56.62
31.4	3.126	35.23	36.700	39.14	14.257	40.80	61.49	59.27
Apr. 10.4	3.053	36.14	36.635	39.38	14.100	43.19	61.29	61.79
20.4	2.958	36.78	36.547	39.75	13.893	45.35	61.05	64.04
30.4	2.845	37.16	36.444	40.25	13.647	47.22	60.75	65.97
May 10.3	2.721	37.28	36.329	40.82	13.378	48.70	60.42	67.50
20.3	2.590	37.17	36.211	41.46	13.095	49.82	60.07	68.57
30.3	2.460	36.81	36.091	42.13	12.807	50.46	59.72	69.18
June 9.2	2.330	36.21	35.975	42.82	12.528	50.68	59.38	69.32
19.2	2.207	35.41	35.867	43.50	12.265	50.44	59.05	68.97
29.2	2.093	34.43	35.768	44.18	12.025	49.76	58.75	68.14
July 9.2	1.991	33.29	35.683	44.80	11.814	48.64	58.49	66.87
19.1	1.904	32.02	35.612	45.39	11.638	47.15	58.26	65.20
29.1	1.834	30.63	35.558	45.90	11.500	45.30	58.08	63.16
Aug. 8.1	1.786	29.23	35.524	46.31	11.406	43.10	57.96	60.74
18.1	1.761	27.83	35.513	46.59	11.357	40.65	57.89	58.08
28.0	1.765	26.50	35.527	46.71	11.359	37.94	57.88	55.15
Sept. 7.0	1.801	25.28	35.569	46.65	11.412	35.06	57.93	52.06
17.0	1.870	24.25	35.643	46.39	11.521	32.04	58.04	48.87
26.9	1.977	23.48	35.752	45.89	11.689	28.95	58.22	45.60
Oct. 6.9	2.123	22.99	35.893	45.16	11.913	25.83	58.48	42.33
16.9	2.306	22.87	36.072	44.14	12.197	22.77	58.80	39.14
26.9	2.530	23.12	36.288	42.88	12.539	19.84	59.18	36.13
Nov. 5.8	2.788	23.76	36.537	41.39	12.934	17.09	59.63	33.32
15.8	3.077	24.82	36.817	39.67	13.375	14.60	60.13	30.82
25.8	3.389	26.24	37.121	37.80	13.857	12.44	60.68	28.69
Dec. 5.8	3.716	28.00	37.438	35.81	14.363	10.70	61.26	27.02
15.7	4.046	30.05	37.764	33.77	14.885	9.44	61.85	25.85
25.7	4.370	32.32	38.085	31.73	15.403	8.67	62.44	25.21
35.7	4.678	34.73	38.390	29.79	15.902	8.47	63.01	25.15
Mean Place	1.263	19.21	35.074	52.28	12.420	43.75	59.480	61.27
Sec δ , Tan δ	1.051	-0.323	1.002	+0.070	1.826	+1.528	2.142	+1.894
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.021	+0.062	+0.005	+0.072	+0.098	+0.074	+0.122
$D\psi\delta$, $D\omega\delta$	-0.38	+0.28	-0.38	+0.27	-0.38	+0.27	-0.38	+0.26

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Leonis. Mag. 4.7		p^4 Leonis. Mag. 5.7		ψ Ursæ Majoris. Mag. 3.2		β Crateris. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 1	° ' + 7 44	h m 11 2	° ' + 2 22	h m 11 5	° ' +44 54	h m 11 7	° ' -22 24
	s	"	s	"	s	"	s	"
Jan. 0.7	3.169	63.95	59.048	22.15	20.564	43.67	52.855	15.01
10.7	3.463 ²⁹⁴	62.20 ¹⁷⁵	59.342 ²⁹⁴	20.22 ¹⁹³	20.953 ³⁸⁹	43.26 ⁴¹	53.158 ³⁰³	17.53 ²⁵²
20.6	3.728 ²⁶⁵	60.66 ¹⁵⁴	59.602 ²⁶⁰	18.46 ¹⁷⁶	21.304 ³⁵¹	43.36 ¹⁰	53.429 ²⁷¹	20.12 ²⁵³
30.6	3.954 ²²⁶	59.39 ¹²⁷	59.826 ²²⁴	16.91 ¹⁵⁵	21.611 ³⁰⁷	43.91 ⁵⁵	53.661 ²³²	22.72 ²⁶⁰
Feb. 9.6	4.138 ¹⁸⁴	58.39 ¹⁰⁰	60.009 ¹⁸³	15.62 ¹²⁹	21.863 ²⁵²	44.93 ¹⁰²	53.849 ¹⁸⁸	25.23 ²⁵¹
	139	71	138	104	189	141	140	238
19.5	4.277 ⁹¹	57.68 ⁴²	60.147 ⁹¹	14.58 ⁷⁷	22.052 ¹²²	46.34 ¹⁷³	53.989 ⁹²	27.61 ²¹⁹
Mar. 1.5	4.368 ⁴⁴	57.26 ¹⁸	60.238 ⁴⁵	13.81 ⁵¹	22.174 ⁶¹	48.07 ¹⁹⁴	54.081 ⁴⁶	29.80 ¹⁹⁸
11.5	4.412 ⁶	57.08 ⁸	60.283 ⁷	13.30 ²⁵	22.235 ²	50.01 ²¹⁰	54.127 ⁶	31.78 ¹⁷⁴
21.5	4.418 ³²	57.16 ²⁶	60.290 ³⁰	13.05 ³	22.237 ⁵⁴	52.11 ²¹⁴	54.133 ³¹	33.52 ¹⁴⁷
31.4	4.386 ⁶³	57.42 ⁴²	60.260 ⁶²	13.02 ¹²	22.183 ¹⁰³	54.25 ²⁰⁸	54.102 ⁶⁴	34.99 ¹¹⁸
Apr. 10.4	4.323 ⁸⁶	57.84 ⁵⁵	60.198 ⁸¹	13.14 ³⁰	22.080 ¹⁴⁰	56.33 ¹⁹⁶	54.038 ⁸⁸	36.17 ⁹⁰
20.4	4.237 ¹⁰²	58.39 ⁶¹	60.117 ⁹⁹	13.44 ⁴⁵	21.940 ¹⁶⁶	58.29 ¹⁷⁶	53.950 ¹⁰⁸	37.07 ⁶²
30.4	4.135 ¹¹⁵	59.03 ⁷⁰	60.018 ¹¹²	13.89 ⁵¹	21.774 ¹⁸⁷	60.05 ¹⁵⁰	53.842 ¹²¹	37.69 ³⁴
May 10.3	4.020 ¹¹⁸	59.73 ⁷²	59.906 ¹¹⁶	14.40 ⁶²	21.587 ¹⁹⁹	61.55 ¹¹⁷	53.721 ¹³⁰	38.03 ⁶
20.3	3.902 ¹²¹	60.45 ⁷¹	59.790 ¹²⁰	15.02 ⁶⁶	21.388 ²⁰²	62.72 ⁸⁴	53.591 ¹³⁴	38.09 ²¹
30.3	3.781 ¹¹⁸	61.16 ⁷⁰	59.670 ¹¹⁶	15.68 ⁷⁰	21.186 ¹⁹⁷	63.56 ⁵⁰	53.457 ¹³³	37.88 ⁴⁷
June 9.2	3.663 ¹⁰⁹	61.86 ⁶⁵	59.554 ¹⁰⁹	16.38 ⁶⁹	20.989 ¹⁸⁶	64.06 ¹⁰	53.324 ¹³⁰	37.41 ⁷³
19.2	3.554 ¹⁰²	62.51 ⁶⁰	59.445 ¹⁰²	17.07 ⁷¹	20.803 ¹⁷¹	64.16 ²⁷	53.194 ¹²³	36.68 ⁹⁴
29.2	3.452 ⁸⁸	63.11 ⁵²	59.343 ⁹⁰	17.78 ⁶⁶	20.632 ¹⁵³	63.89 ⁶⁶	53.071 ¹¹²	35.74 ¹¹⁶
July 9.2	3.364 ⁷⁴	63.63 ⁴⁶	59.253 ⁷⁵	18.44 ⁶³	20.479 ¹²⁶	63.23 ⁹⁸	52.959 ¹⁰¹	34.58 ¹³²
19.1	3.290 ⁵⁶	64.09 ³⁵	59.178 ⁵⁹	19.07 ⁵⁷	20.353 ¹⁰²	62.25 ¹³³	52.858 ⁸³	33.26 ¹⁴⁶
29.1	3.234 ³⁸	64.44 ²⁰	59.119 ³⁹	19.64 ¹⁷	20.251 ⁶⁹	60.92 ¹⁶¹	52.775 ⁶²	31.80 ¹⁵²
Aug. 8.1	3.196 ¹⁶	64.64 ⁷	59.080 ²⁰	20.11 ³⁹	20.182 ³⁹	59.31 ¹⁹⁰	52.713 ³⁹	30.28 ¹⁵⁶
18.1	3.180 ¹⁰	64.71 ¹⁰	59.060 ⁸	20.50 ¹⁹	20.143 ¹	57.41 ²¹⁵	52.674 ⁹	28.72 ¹⁵²
28.0	3.190 ³⁹	64.61 ²⁷	59.068 ³⁵	20.69 ⁴	20.142 ³⁸	55.26 ²³⁸	52.665 ²¹	27.20 ¹⁴³
Sept. 7.0	3.229 ⁶⁹	64.34 ⁵⁰	59.103 ⁶⁷	20.73 ¹⁵	20.180 ⁸⁴	52.88 ²⁵⁴	52.686 ⁵⁸	25.77 ¹²⁷
17.0	3.298 ¹⁰⁴	63.84 ⁷¹	59.170 ¹⁰⁰	20.58 ⁴³	20.264 ¹²⁶	50.34 ²⁶⁹	52.744 ⁹⁷	24.50 ¹⁰²
26.9	3.402 ¹³⁸	63.13 ⁹⁷	59.270 ¹³⁸	20.15 ⁶⁷	20.390 ¹⁷¹	47.65 ²⁷⁶	52.841 ¹³⁷	23.48 ⁷⁴
Oct. 6.9	3.540 ¹⁷⁶	62.16 ¹¹⁹	59.408 ¹⁷³	19.48 ⁹²	20.562 ²²³	44.89 ²⁸⁰	52.978 ¹⁷⁹	22.74 ³⁹
16.9	3.716 ²¹³	60.97 ¹⁴²	59.581 ²¹¹	18.56 ¹¹⁸	20.785 ²⁶⁷	42.09 ²⁷⁶	53.157 ²²⁰	22.35 ⁰
26.9	3.929 ²⁴⁶	59.55 ¹⁶⁴	59.792 ²⁴¹	17.38 ¹⁴⁴	21.052 ³¹³	39.33 ²⁶⁹	53.377 ²⁵⁶	22.35 ⁴²
Nov. 5.8	4.175 ²⁷⁹	57.91 ¹⁸²	60.033 ²⁷⁷	15.94 ¹⁶⁹	21.365 ³⁵³	36.64 ²⁵²	53.633 ²⁹¹	22.77 ⁸⁴
15.8	4.454 ³⁰²	56.09 ¹⁹⁴	60.310 ³⁰¹	14.25 ¹⁸⁵	21.718 ³⁸⁸	34.12 ²²⁹	53.924 ³¹⁶	23.61 ¹²⁶
25.8	4.756 ³¹⁸	54.15 ²⁰³	60.611 ³¹⁴	12.40 ¹⁹⁸	22.106 ⁴¹⁰	31.83 ¹⁹⁸	54.240 ³³²	24.87 ¹⁶⁴
Dec. 5.8	5.074 ³²⁶	52.12 ²⁰²	60.925 ³²⁴	10.42 ²⁰⁶	22.516 ⁴²²	29.85 ¹⁶¹	54.572 ³³⁹	26.51 ¹⁹⁷
15.7	5.400 ³²³	50.10 ¹⁹⁹	61.249 ³²⁰	8.36 ²⁰⁶	22.938 ⁴²¹	28.24 ¹¹⁷	54.911 ³³³	28.48 ²²⁴
25.7	5.723 ³¹⁰	48.11 ¹⁸⁵	61.569 ³⁰⁷	6.30 ²⁰¹	23.359 ⁴⁰⁷	27.07 ⁷¹	55.244 ³²¹	30.72 ²⁴⁵
35.7	6.033	46.26	61.876	4.29	23.766	26.36	55.565	33.17
Mean Place	2.780	69.85	58.613	26.23	20.538	59.76	52.114	19.20
Sec δ , Tan δ	1.009	+0.136	1.001	+0.041	1.412	+0.997	1.082	-0.412
$D\psi\alpha$, $D\omega\alpha$	+0.062	+0.009	+0.061	+0.003	+0.067	+0.065	+0.059	-0.027
$D\psi\delta$, $D\omega\delta$	-0.38	+0.25	-0.39	+0.25	-0.39	+0.24	-0.39	+0.23

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Leonis. Mag. 2.6		θ Leonis. Mag. 3.4		ν Ursæ Majoris. Mag. 3.7		δ Crateris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 10 s	° ' " +20 56 "	h m 11 10 s	° ' " +15 50 "	h m 11 14 s	° ' " +33 30 "	h m 11 15 s	° ' " -14 21 "
Jan. 0.7	1.204 ³¹⁶	35.05 ¹³³	12.318 ³⁰⁸	54.24 ¹⁵²	19.545 ³⁴¹	39.86 ⁹¹	29.935 ³⁰⁰	40.02 ²³³
10.7	1.520 ²⁸⁵	33.72 ¹⁰²	12.626 ²⁷⁸	52.72 ¹²²	19.889 ³¹⁷	38.95 ⁴⁶	30.235 ²⁷⁰	42.35 ²³⁴
20.6	1.805 ²⁴⁷	32.70 ⁶³	12.904 ²⁴²	51.50 ⁹²	20.206 ²⁷⁷	38.49 ⁶	30.505 ²³⁵	44.69 ²²⁷
30.6	2.052 ²⁰⁵	32.07 ³¹	13.146 ¹⁹⁹	50.58 ⁵⁶	20.483 ²²⁷	38.43 ³⁹	30.740 ¹⁹¹	46.96 ²¹⁴
Feb. 9.6	2.257 ¹⁵⁶	31.76 ⁵	13.345 ¹⁵²	50.02 ²⁶	20.710 ¹⁸⁰	38.82 ⁷⁴	30.931 ¹⁴⁷	49.10 ¹⁹⁶
19.6	2.413 ¹⁰⁸	31.81 ³⁵	13.497 ¹⁰⁴	49.76 ⁴	20.890 ¹²⁰	39.56 ¹¹⁰	31.078 ¹⁰¹	51.06 ¹⁷⁸
Mar. 1.5	2.521 ⁶¹	32.16 ⁶³	13.601 ⁵⁷	49.80 ³³	21.010 ⁷⁰	40.66 ¹³⁴	31.179 ⁵⁵	52.84 ¹⁵²
11.5	2.582 ¹⁴	32.79 ⁸⁷	13.658 ¹⁵	50.13 ⁵⁵	21.080 ¹⁵	42.00 ¹⁵⁵	31.234 ¹⁸	54.36 ¹²⁵
21.5	2.596 ²⁷	33.66 ⁹⁷	13.673 ²⁴	50.68 ⁷¹	21.095 ³⁰	43.55 ¹⁶⁷	31.252 ¹⁹	55.61 ¹⁰³
31.4	2.569 ⁶⁰	34.63 ¹¹²	13.649 ⁵⁸	51.42 ⁸⁵	21.065 ⁰⁹	45.22 ¹⁷⁰	31.233 ⁵¹	56.64 ⁷⁷
Apr. 10.4	2.509 ⁸⁵	35.75 ¹¹⁵	13.591 ⁸³	52.27 ⁹³	20.996 ¹⁰¹	46.92 ¹⁶⁶	31.182 ⁷⁷	57.41 ⁵⁰
20.4	2.424 ¹⁰⁷	36.90 ¹¹³	13.508 ¹⁰⁰	53.20 ⁹⁶	20.895 ¹²⁵	48.58 ¹⁵⁵	31.105 ⁹³	57.91 ³⁰
30.4	2.317 ¹²¹	38.03 ¹⁰⁸	13.408 ¹¹⁵	54.16 ⁹⁶	20.770 ¹⁴²	50.13 ¹³⁹	31.012 ¹⁰⁹	58.21 ⁴
May 10.3	2.196 ¹²⁷	39.11 ⁸⁴	13.293 ¹²²	55.12 ⁸⁹	20.628 ¹⁵¹	51.52 ¹¹⁸	30.903 ¹¹⁷	58.25 ¹⁴
20.3	2.069 ¹³¹	40.12 ⁷⁰	13.171 ¹²⁵	56.01 ⁸¹	20.477 ¹⁵⁷	52.70 ⁹⁴	30.786 ¹²²	58.11 ³⁶
30.3	1.938 ¹²⁷	40.96 ⁵³	13.046 ¹¹⁷	56.82 ⁷²	20.320 ¹⁵⁴	53.64 ⁶⁶	30.664 ¹²²	57.75 ⁵⁶
June 9.3	1.811 ¹²²	41.66 ³⁵	12.925 ¹⁰⁶	57.54 ⁴⁵	20.166 ¹¹⁷	54.30 ⁴⁰	30.542 ¹²⁰	57.19 ⁷³
19.2	1.689 ¹¹²	42.19 ¹⁸	12.808 ⁹⁷	58.13 ³³	20.019 ¹³⁶	54.70 ⁹	30.422 ¹¹²	56.46 ⁸⁹
29.2	1.577 ¹⁰⁰	42.54 ⁴	12.702 ⁸⁰	58.58 ¹⁶	19.883 ¹²³	54.79 ²⁰	30.310 ¹⁰⁴	55.57 ⁹⁹
July 9.2	1.477 ⁸⁶	42.72 ²¹	12.605 ⁴⁶	58.91 ¹	19.760 ¹⁰⁵	54.59 ⁵⁰	30.206 ⁹³	54.58 ¹¹²
19.1	1.391 ⁶⁵	42.68 ⁴⁴	12.525 ²³	59.07 ¹⁹	19.655 ⁸⁵	54.09 ⁷⁹	30.113 ⁷⁹	53.46 ¹¹⁷
29.1	1.326 ⁴⁶	42.44 ⁶⁶	12.461 ³¹	59.06 ³⁷	19.570 ⁵⁹	53.30 ¹⁰¹	30.034 ⁵⁷	52.29 ¹¹⁹
Aug. 8.1	1.280 ²⁵	42.00 ⁸⁸	12.415 ⁸⁰	58.87 ⁵⁸	19.511 ³⁸	52.26 ¹³¹	29.977 ³⁷	51.10 ¹¹⁹
18.1	1.255 ³	41.34 ¹⁰⁶	12.392 ³¹	58.50 ⁷⁷	19.473 ²⁹	50.95 ¹⁵⁶	29.940 ¹³	49.91 ¹¹⁰
28.0	1.258 ³³	40.46 ¹³⁰	12.395 ⁶²	57.92 ¹²²	19.469 ¹⁷⁷	49.39 ¹⁷⁷	29.927 ¹⁷	48.81 ¹⁰¹
Sept. 7.0	1.291 ⁶⁴	39.40 ¹¹⁹	12.426 ⁹⁷	57.15 ¹⁴⁰	19.498 ⁶²	47.62 ¹⁹⁸	29.944 ⁵²	47.80 ⁸⁰
17.0	1.355 ¹⁰¹	38.10 ¹⁷¹	12.488 ¹³⁴	56.17 ¹⁷⁹	19.560 ¹⁰⁴	45.64 ²¹⁸	29.996 ⁸⁷	47.00 ⁶⁰
27.0	1.456 ¹³⁵	36.61 ¹⁸⁵	12.585 ²¹⁰	54.95 ¹⁶³	19.664 ¹⁴¹	43.46 ²³²	30.083 ¹²⁷	46.40 ³⁰
Oct. 6.9	1.591 ¹⁷⁷	34.90 ¹⁹⁷	12.719 ²⁴⁶	53.55 ¹⁹³	19.805 ¹⁸⁵	41.14 ²⁴²	30.210 ¹⁶⁵	46.10 ³
16.9	1.768 ²¹⁵	33.05 ²¹³	12.891 ²⁷⁸	51.92 ²⁰⁵	19.990 ²²⁸	38.72 ²⁴⁸	30.375 ²⁰⁶	46.13 ³⁵
26.9	1.983 ²⁵⁰	31.08 ²¹⁷	13.101 ³⁰⁶	50.13 ²¹²	20.218 ²⁶⁸	36.24 ²⁴⁹	30.581 ²⁴⁴	46.48 ⁷³
Nov. 5.8	2.233 ²⁸⁷	28.95 ²²⁰	13.347 ³²⁵	48.20 ²⁰³	20.486 ³⁰⁶	33.75 ²⁴⁴	30.825 ²⁷⁵	47.21 ¹¹⁰
15.8	2.520 ³¹²	26.78 ²⁰⁹	13.625 ³³⁴	46.15 ¹⁸⁸	20.792 ³⁷⁴	31.31 ²³⁴	31.100 ³⁰⁴	48.31 ¹⁴³
25.8	2.832 ³³¹	24.58 ¹⁹⁰	13.931 ³³³	44.03 ¹⁶⁶	21.128 ³⁷²	28.97 ¹⁵⁵	31.404 ³²⁶	49.74 ²¹⁹
Dec. 5.8	3.163 ³⁴¹	22.49 ¹⁵⁰	14.256 ³²²	41.95 ¹⁶⁶	21.488 ³⁵⁹	26.85 ¹¹⁷	31.723 ³¹⁹	51.49 ²⁰⁰
15.7	3.504 ³⁴³	20.50 ¹⁸⁰	14.590 ³³³	39.92 ¹⁸⁸	21.860 ³⁷⁴	24.97 ¹⁵⁵	32.054 ³²⁶	53.49 ²¹⁹
25.7	3.847 ³²⁹	18.70 ¹⁵⁰	14.923 ³²²	38.04 ¹⁶⁶	22.234 ³⁷⁴	23.42 ¹⁵⁵	32.380 ³²⁶	55.68 ²¹⁹
35.7	4.176 ³²⁹	17.20 ¹⁵⁰	15.245 ³²²	36.38 ¹⁶⁶	22.593 ³⁵⁹	22.25 ¹¹⁷	32.696 ³¹⁶	57.99 ²³¹
Mean Place	0.991	44.76	12.060	62.38	19.478	53.03	29.362	42.01
Sec δ , Tan δ	1.071	+0.383	1.040	+0.284	1.199	+0.662	1.032	-0.256
$D\psi\alpha$, $D\omega\alpha$	+0.063	+0.025	+0.063	+0.018	+0.065	+0.043	+0.060	-0.017
$D\psi\delta$, $D\omega\delta$	-0.39	+0.22	-0.39	+0.22	-0.39	+0.20	-0.39	+0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Leonis. Mag. 4.1			π Centauri. Mag. 4.3			ι Leonis. Mag. 4.0			τ Leonis. Mag. 5.2		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 11 17	s + 6 26	° ' "	h m 11 17	s -54 3	° ' "	h m 11 19	s +10 56	° ' "	h m 11 23	s + 3 16	° ' "
Jan. 0.7	10.343	60.99	183	30.964	54.50	266	54.913	66.50	170	58.979	46.27	195
10.7	10.642	59.16	183	31.382	57.16	302	55.218	64.80	147	59.282	44.32	176
20.6	10.917	57.53	163	31.752	60.18	325	55.498	63.33	118	59.557	42.56	154
30.6	11.155	56.14	139	32.068	63.43	343	55.743	62.15	88	59.798	41.02	128
Feb. 9.6	11.353	55.05	109	32.320	66.86	350	55.946	61.27	56	59.999	39.74	101
19.6	11.508	54.22	83	32.506	70.36	347	56.104	60.71	26	60.159	38.73	73
Mar. 1.5	11.614	53.70	52	32.625	73.83	337	56.216	60.45	1	60.270	38.00	45
11.5	11.676	53.44	28	32.679	77.20	321	56.283	60.46	27	60.340	37.55	22
21.5	11.697	53.44	0	32.671	80.41	298	56.307	60.73	46	60.367	37.33	2
31.4	11.681	53.64	20	32.608	83.39	269	56.293	61.19	62	60.359	37.35	22
Apr. 10.4	11.634	54.00	36	32.496	86.08	234	56.249	61.81	73	60.318	37.57	33
20.4	11.561	54.52	52	32.341	88.42	199	56.177	62.54	80	60.253	37.90	49
30.4	11.472	55.13	61	32.149	90.41	155	56.086	63.34	83	60.168	38.39	58
May 10.3	11.366	55.82	69	31.931	91.96	112	55.981	64.17	83	60.070	38.97	65
20.3	11.255	56.53	71	31.689	93.08	66	55.868	65.00	79	59.962	39.62	70
30.3	11.139	57.26	71	31.431	93.74	19	55.752	65.79	73	59.849	40.32	70
June 9.3	11.023	57.97	69	31.170	93.93	28	55.635	66.52	66	59.735	41.02	71
19.2	10.912	58.66	63	30.905	93.65	73	55.522	67.18	57	59.625	41.73	68
29.2	10.808	59.29	58	30.644	92.92	120	55.416	67.75	46	59.520	42.41	65
July 9.2	10.713	59.87	48	30.395	91.72	159	55.320	68.21	35	59.422	43.06	62
19.1	10.630	60.35	40	30.166	90.13	197	55.236	68.56	20	59.333	43.68	50
29.1	10.563	60.75	28	29.963	88.16	225	55.166	68.76	6	59.264	44.18	43
Aug. 8.1	10.514	61.03	13	29.793	85.91	230	55.114	68.82	10	59.210	44.61	27
18.1	10.483	61.16	3	29.666	83.41	261	55.083	68.72	30	59.172	44.88	14
28.0	10.479	61.13	22	29.587	80.77	270	55.076	68.42	48	59.161	45.02	3
Sept. 7.0	10.501	60.91	41	29.565	78.07	261	55.097	67.94	71	59.175	44.99	25
17.0	10.554	60.47	65	29.604	75.43	250	55.147	67.23	92	59.223	44.74	48
27.0	10.641	59.82	90	29.706	72.93	225	55.232	66.31	116	59.303	44.26	72
Oct. 6.9	10.763	58.92	114	29.877	70.68	189	55.355	65.15	137	59.420	43.54	96
16.9	10.926	57.78	138	30.116	68.79	145	55.515	63.78	160	59.574	42.58	126
26.9	11.126	56.40	162	30.417	67.34	95	55.715	62.18	179	59.769	41.32	149
Nov. 5.8	11.362	54.78	180	30.776	66.39	38	55.950	60.39	191	60.001	39.83	170
15.8	11.631	52.98	195	31.184	66.01	21	56.220	58.45	205	60.263	38.13	189
25.8	11.929	51.03	203	31.627	66.22	82	56.518	56.40	210	60.557	36.24	200
Dec. 5.8	12.243	49.00	208	32.093	67.04	130	56.836	54.30	207	60.870	34.24	208
15.7	12.568	46.92	204	32.565	68.43	193	57.165	52.23	199	61.194	32.16	208
25.7	12.893	44.88	193	33.028	70.36	240	57.495	50.24	184	61.519	30.08	201
35.7	13.208	42.95		33.467	72.76		57.815	48.40		61.833	28.07	
Mean Place	10.029	65.86		29.365	67.93		54.861	72.75		58.670	49.80	
Sec δ , Tan δ	1.006	+0.113		1.704	-1.380		1.018	+0.194		1.002	+0.057	
$D\alpha$, $D\omega$	+0.062	+0.007		+0.054	-0.090		+0.062	+0.013		+0.061	+0.004	
$D\psi$, $D\omega$	-0.39	+0.19		-0.39	+0.18		-0.39	+0.17		-0.39	+0.16	

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Draconis. Mag. 4.1		ξ Hydræ. Mag. 3.7		λ Centauri. Mag. 3.3		ν Leonis. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 26	° ' " +69 44	h m 11 29	° ' " -31 25	h m 11 32	° ' " -62 35	h m 11 33	° ' " - 0 23
	s		s		s		s	
Jan. 0.7	50.51	62.76	13.468	45.33	15.16	21.31	0.671	56.43
10.7	51.24 73	62.95 19	13.799 331	47.85 252	15.68 52	23.77 246	0.978 307	58.47 204
20.6	51.90 66	63.77 82	14.097 298	50.56 271	16.14 46	26.64 287	1.256 278	60.37 190
30.6	52.50 60	65.17 140	14.358 261	53.36 280	16.55 41	29.84 320	1.502 246	62.10 173
Feb. 9.6	52.99 49	67.08 191	14.573 215	56.16 280	16.88 33	33.27 343	1.709 207	63.57 147
	38	231	168	275	24	360	165	127
19.6	53.37 26	69.39 266	14.741 117	58.91 264	17.12 17	36.87 361	1.874 122	64.84 96
Mar. 1.5	53.63 14	72.05 287	14.858 72	61.55 216	17.29 9	40.51 360	1.996 77	65.80 67
11.5	53.77 2	74.92 296	14.930 28	64.01 223	17.38 1	44.11 349	2.073 36	66.47 44
21.5	53.79 11	77.88 294	14.958 15	66.24 199	17.39 6	47.60 330	2.109 0	66.91 18
31.5	53.68 21	80.82 283	14.943 47	68.23 173	17.33 12	50.90 307	2.109 31	67.09 0
Apr. 10.4	53.47 30	83.65 251	14.896 80	69.96 141	17.21 19	53.97 275	2.078 56	67.09 20
20.4	53.17 38	86.19 224	14.816 100	71.37 112	17.02 23	56.72 238	2.022 78	66.89 32
30.4	52.79 43	88.43 183	14.716 121	72.49 79	16.79 27	59.10 198	1.944 93	66.57 44
May 10.3	52.36 48	90.26 133	14.595 135	73.28 46	16.52 31	61.08 154	1.851 102	66.13 54
20.3	51.88 49	91.59 87	14.460 144	73.74 13	16.21 31	62.62 105	1.749 110	65.59 64
30.3	51.39 50	92.46 33	14.316 148	73.87 18	15.87 35	63.67 55	1.639 112	64.95 68
June 9.3	50.89 50	92.79 18	14.168 150	73.69 51	15.52 36	64.22 7	1.527 111	64.27 71
19.2	50.39 46	92.61 71	14.018 116	73.18 82	15.16 36	64.29 45	1.416 107	63.56 73
29.2	49.93 43	91.87 119	13.872 140	72.36 108	14.80 36	63.84 93	1.309 101	62.83 72
July 9.2	49.50 39	90.68 168	13.732 130	71.28 136	14.44 33	62.91 141	1.208 92	62.11 69
19.2	49.11 33	89.00 209	13.602 113	69.92 156	14.11 30	61.50 184	1.116 77	61.42 64
29.1	48.78 26	86.91 250	13.489 97	68.36 171	13.81 26	59.66 220	1.039 63	60.78 58
Aug. 8.1	48.52 20	84.41 282	13.392 70	66.65 183	13.55 21	57.46 250	0.976 16	60.20 48
18.1	48.32 12	81.59 311	13.322 43	64.82 185	13.34 14	54.96 273	0.930 20	59.72 35
28.0	48.20 3	78.48 329	13.279 5	62.97 182	13.20 8	52.23 284	0.910 4	59.37 16
Sept. 7.0	48.17 5	75.19 345	13.274 32	61.15 170	13.12 0	49.39 287	0.914 39	59.21 2
17.0	48.22 15	71.74 353	13.306 76	59.45 155	13.12 9	46.52 280	0.953 71	59.23 25
27.0	48.37 24	68.21 355	13.382 119	57.90 124	13.21 18	43.72 257	1.024 108	59.48 52
Oct. 6.9	48.61 33	64.66 349	13.501 171	56.66 93	13.39 26	41.15 229	1.132 147	60.00 77
16.9	48.94 43	61.17 333	13.672 214	55.73 55	13.65 35	38.86 186	1.279 184	60.77 105
26.9	49.37 51	57.84 311	13.886 255	55.18 8	14.00 42	37.00 138	1.463 226	61.82 131
Nov. 5.9	49.88 60	54.73 276	14.141 298	55.10 38	14.42 48	35.62 81	1.689 258	63.13 158
15.8	50.48 66	51.97 239	14.439 325	55.48 85	14.90 53	34.81 25	1.947 288	64.71 180
25.8	51.14 72	49.58 193	14.764 348	56.33 129	15.43 57	34.56 41	2.235 310	66.51 195
Dec. 5.8	51.86 75	47.65 138	15.112 358	57.62 174	16.00 58	34.97 103	2.545 322	68.46 207
15.7	52.61 76	46.27 81	15.470 360	59.36 206	16.58 56	36.00 162	2.867 324	70.53 212
25.7	53.37 75	45.46 19	15.830 342	61.42 240	17.14 55	37.62 214	3.191 317	72.65 209
35.7	54.12	45.27	16.172	63.82	17.69	39.76	3.508	74.74
Mean Place	51.176	82.43	12.687	53.52	13.157	37.41	0.371	54.53
Sec δ, Tan δ	2.889	+2.711	1.172	-0.611	2.173	-1.929	1.000	-0.007
Dψα, Dωα	+0.072	+0.179	+0.059	-0.040	+0.055	-0.128	+0.061	0.000
Dψδ, Dωδ	-0.39	+0.14	-0.39	+0.13	-0.40	+0.12	-0.40	+0.12

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Chamæleonis. Mag. 5.7		δ Draconis. Mag. 5.5		ζ Crateris. Mag. 4.9		χ Ursæ Majoris. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 34	° ' -75 27	h m 11 38	° ' +67 9	h m 11 40	° ' -17 55	h m 11 41	° ' +48 11
	s "	"	s "	"	s "	"	s "	"
Jan. 0.7	8.38	55.03	10.86	56.91	51.935	16.93	59.193	66.97
10.7	9.24	57.26	11.52	56.89	52.251	19.26	59.618	66.32
20.7	10.02	59.99	12.14	57.46	52.540	21.65	60.013	66.17
30.6	10.69	63.12	12.69	58.64	52.796	24.00	60.368	66.57
Feb. 9.6	11.24	66.56	13.16	60.35	53.012	26.28	60.670	67.48
19.6	11.64	70.21	13.53	62.52	53.185	28.41	60.915	68.84
Mar. 1.5	11.90	73.98	13.80	65.05	53.313	30.37	61.094	70.61
11.5	12.03	77.79	13.95	67.83	53.398	32.10	61.209	72.64
21.5	12.01	81.55	14.00	70.74	53.440	33.62	61.260	74.91
31.5	11.87	85.16	13.94	73.67	53.446	34.86	61.249	77.28
Apr. 10.4	11.61	88.57	13.78	76.49	53.421	35.86	61.185	79.65
20.4	11.23	91.69	13.54	79.12	53.367	36.62	61.075	81.90
30.4	10.75	94.47	13.23	81.43	53.290	37.13	60.927	84.01
May 10.4	10.20	96.84	12.86	83.38	53.196	37.40	60.748	85.86
20.3	9.57	98.76	12.46	84.88	53.090	37.44	60.552	87.40
30.3	8.89	100.20	12.03	85.91	52.975	37.25	60.341	88.57
June 9.3	8.17	101.10	11.60	86.43	52.856	36.88	60.129	89.36
19.2	7.42	101.47	11.16	86.44	52.734	36.28	59.914	89.77
29.2	6.67	101.29	10.75	85.91	52.613	35.51	59.710	89.75
July 9.2	5.94	100.57	10.36	84.91	52.497	34.58	59.517	89.32
19.2	5.25	99.33	10.00	83.43	52.390	33.51	59.343	88.48
29.1	4.61	97.60	9.70	81.51	52.293	32.34	59.191	87.24
Aug. 8.1	4.06	95.43	9.44	79.19	52.212	31.10	59.066	85.68
18.1	3.61	92.89	9.25	76.52	52.152	29.85	58.972	83.76
28.1	3.28	90.08	9.12	73.55	52.113	28.64	58.912	81.55
Sept. 7.0	3.08	87.07	9.07	70.35	52.105	27.49	58.892	79.06
17.0	3.04	83.97	9.09	66.96	52.129	26.50	58.920	76.35
27.0	3.15	80.92	9.19	63.46	52.190	25.71	58.992	73.49
Oct. 6.9	3.42	78.01	9.38	59.92	52.295	25.18	59.115	70.48
16.9	3.85	75.38	9.65	56.42	52.439	24.95	59.291	67.41
26.9	4.44	73.12	10.01	53.03	52.626	25.07	59.521	64.34
Nov. 5.9	5.15	71.33	10.45	49.83	52.855	25.56	59.806	61.33
15.8	5.97	70.09	10.98	46.93	53.121	26.43	60.137	58.46
25.8	6.87	69.47	11.55	44.37	53.418	27.67	60.513	55.83
Dec. 5.8	7.82	69.50	12.19	42.26	53.738	29.23	60.923	53.50
15.8	8.80	70.17	12.86	40.68	54.070	31.09	61.354	51.55
25.7	9.75	71.47	13.55	39.65	54.405	33.20	61.797	50.03
35.7	10.66	73.40	14.23	39.24	54.731	35.48	62.234	49.03
Mean Place	4.471	73.09	11.606	76.08	51.458	21.38	59.519	82.96
Sec δ , Tan δ	3.986	-3.859	2.577	+2.375	1.051	-0.323	1.500	+1.118
$D\psi\alpha$, $D\omega\alpha$	+0.050	-0.255	+0.067	+0.158	+0.060	-0.021	+0.063	+0.074
$D\psi\delta$, $D\omega\delta$	-0.40	+0.11	-0.40	+0.10	-0.40	+0.08	-0.40	+0.08

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Leonis. (Denebola.) Mag. 2.2		β Virginis. Mag. 3.8		Groombridge 1830. Mag. 6.5		γ Ursæ Majoris. Mag. 2.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 45 s	° ' " +14 59 "	h m 11 46 s	° ' " + 2 11 "	h m 11 48 s	° ' " +38 15 "	h m 11 49 s	° ' " +54 6 "
Jan. 0.7	8.085	62.57	41.252	53.22	32.574	63.82	46.851	65.39
10.7	8.403	60.87	41.564	51.22	32.958	62.61	47.325	64.84
20.7	8.699	59.46	41.852	49.38	33.320	61.88	47.768	64.84
30.6	8.964	58.40	42.111	47.76	33.646	61.64	48.169	65.39
Feb. 9.6	9.189	57.63	42.331	46.35	33.927	61.88	48.515	66.47
19.6	9.375	57.25	42.510	45.26	34.158	62.56	48.798	68.07
Mar. 1.6	9.512	57.17	42.648	44.42	34.334	63.63	49.007	70.03
11.5	9.605	57.41	42.741	43.88	34.454	65.04	49.145	72.34
21.5	9.653	57.92	42.793	43.58	34.521	66.68	49.208	74.83
31.5	9.663	58.61	42.808	43.54	34.537	68.48	49.204	77.42
Apr. 10.4	9.640	59.49	42.790	43.69	34.507	70.33	49.136	80.00
20.4	9.585	60.45	42.747	44.00	34.439	72.15	49.013	82.44
30.4	9.511	61.49	42.681	44.46	34.341	73.89	48.845	84.72
May 10.4	9.416	62.52	42.597	45.01	34.217	75.46	48.641	86.72
20.3	9.309	63.53	42.503	45.64	34.078	76.79	48.412	88.36
30.3	9.193	64.47	42.399	46.31	33.925	77.86	48.162	89.61
June 9.3	9.077	65.29	42.291	47.01	33.770	78.60	47.908	90.42
19.3	8.959	66.01	42.183	47.72	33.612	79.03	47.652	90.83
29.2	8.843	66.58	42.076	48.41	33.460	79.11	47.405	90.76
July 9.2	8.732	67.04	41.974	49.07	33.317	78.85	47.171	90.22
19.2	8.631	67.28	41.878	49.69	33.187	78.22	46.954	89.27
29.1	8.545	67.35	41.794	50.22	33.074	77.27	46.762	87.91
Aug. 8.1	8.472	67.25	41.725	50.66	32.981	76.00	46.603	86.12
18.1	8.416	66.94	41.671	50.99	32.911	74.40	46.476	84.01
28.1	8.384	66.43	41.639	51.17	32.869	72.52	46.392	81.57
Sept. 7.0	8.378	65.70	41.634	51.17	32.861	70.37	46.349	78.85
17.0	8.403	64.74	41.658	50.98	32.889	67.97	46.358	75.91
27.0	8.464	63.54	41.717	50.55	32.957	65.37	46.421	72.79
Oct. 7.0	8.560	62.13	41.811	49.89	33.070	62.60	46.542	69.57
16.9	8.696	60.52	41.946	48.96	33.229	59.71	46.722	66.29
26.9	8.873	58.68	42.121	47.77	33.436	56.74	46.963	63.02
Nov. 5.9	9.091	56.69	42.337	46.33	33.691	53.77	47.264	59.84
15.8	9.346	54.55	42.589	44.66	33.989	50.86	47.621	56.87
25.8	9.633	52.35	42.872	42.79	34.326	48.08	48.028	54.13
Dec. 5.8	9.944	50.13	43.179	40.78	34.694	45.51	48.473	51.77
15.8	10.271	47.98	43.501	38.67	35.083	43.24	48.946	49.79
25.7	10.605	45.94	43.826	36.56	35.482	41.32	49.433	48.33
35.7	10.933	44.08	44.147	34.49	35.878	39.81	49.919	47.39
Mean Place	8.025	69.20	41.062	55.45	32.807	77.28	47.360	82.35
Sec δ , Tan δ	1.035	+0.268	1.001	+0.038	1.274	+0.789	1.706	+1.382
$D\alpha$, $D\omega$	+0.062	+0.018	+0.061	+0.003	+0.062	+0.053	+0.063	+0.092
$D\psi$, $D\omega$	-0.40	+0.06	-0.40	+0.06	-0.40	+0.05	-0.40	+0.04

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Virginis. Mag. 4.6		α Virginis. Mag. 4.2		δ Centauri. Mag. 2.9		ϵ Corvi. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 11 56 s	° ' " + 7 2 "	h m 12 1 s	° ' " + 9 9 "	h m 12 4 s	° ' " -50 17 "	h m 12 6 s	° ' " -22 11 "
Jan. 0.7	55.702	33.79	17.277	33.84	22.575	22.26	10.080	22.70
10.7	56.017 ³¹⁵	31.87 ¹⁹²	17.594 ³¹⁷	31.97 ¹⁸⁷	23.005 ⁴³⁰	24.50 ²²⁴	10.409 ³²⁹	24.98 ²²⁸
20.7	56.311 ²⁹¹	30.19 ¹⁶⁸	17.891 ²⁹⁷	30.31 ¹⁶⁶	23.401 ³⁹⁶	27.08 ²⁵⁸	10.718 ³⁰⁹	27.33 ²³⁵
30.6	56.579 ²⁶⁸	28.71 ¹⁴⁸	18.162 ²⁷¹	28.93 ¹³⁸	23.758 ³⁵⁷	29.96 ²⁸⁸	10.995 ²⁷⁷	29.74 ²⁴¹
Feb. 9.6	56.807 ²²⁸	27.56 ¹¹⁵	18.394 ²³²	27.88 ¹⁰⁵	24.064 ³⁰⁶	33.04 ³⁰⁸	11.237 ²⁴²	32.10 ²³⁶
	191	87	193	78	249	319	199	228
19.6	56.998 ¹¹⁵	26.69 ⁵⁵	18.587 ¹⁵³	27.10 ⁴²	24.313 ¹⁹²	36.23 ³²⁵	11.436 ¹⁵⁸	34.38 ²¹⁴
Mar. 1.6	57.143 ¹⁰⁴	26.14 ²⁴	18.740 ¹⁰⁶	26.68 ¹³	24.505 ¹³⁵	39.48 ³²¹	11.594 ¹¹¹	36.52 ¹⁹⁵
11.5	57.247 ⁶²	25.90 ⁰	18.846 ⁶⁷	26.55 ¹⁴	24.640 ⁷⁶	42.69 ³⁰⁸	11.705 ⁷²	38.47 ¹⁷⁵
21.5	57.309 ²²	25.90 ²⁵	18.913 ²⁸	26.69 ³⁸	24.716 ²⁵	45.77 ²⁹³	11.777 ³³	40.22 ¹⁵⁴
31.5	57.331 ⁹	26.15 ⁴⁵	18.941 ⁵	27.07 ⁵⁷	24.741 ²³	48.70 ²⁷²	11.810 ¹	41.76 ¹²⁶
Apr. 10.5	57.322	26.60	18.936	27.64	24.718	51.42	11.809	43.02
20.4	57.283 ³⁹	27.19 ⁵⁹	18.901 ³⁵	28.32 ⁶⁸	24.650 ⁶⁸	53.86 ²⁴⁴	11.779 ³⁰	44.03 ¹⁰¹
30.4	57.224 ⁵⁹	27.89 ⁷⁰	18.843 ⁵⁸	29.14 ⁸²	24.543 ¹⁰⁷	55.98 ²¹²	11.724 ⁵⁵	44.84 ⁸¹
May 10.4	57.143 ⁸¹	28.65 ⁷⁶	18.764 ⁷⁹	30.02 ⁸⁸	24.403 ¹⁴⁰	57.75 ¹⁷⁷	11.645 ⁷⁹	45.35 ⁵¹
20.3	57.053 ⁹⁰	29.45 ⁸⁰	18.672 ⁹²	30.90 ⁸⁸	24.235 ¹⁶⁸	59.16 ¹⁴¹	11.551 ⁹⁴	45.63 ²⁸
	104	81	101	87	191	100	106	5
30.3	56.949	30.26	18.571	31.77	24.044	60.16	11.445	45.68
June 9.3	56.841 ¹⁰⁸	31.05 ⁷⁹	18.461 ¹¹⁰	32.59 ⁸²	23.835 ²⁰⁹	60.74 ⁵⁸	11.328 ¹¹⁷	45.48 ²⁰
19.3	56.729 ¹¹²	31.80 ⁷⁵	18.349 ¹¹²	33.35 ⁷⁶	23.614 ²²¹	60.89 ¹⁵	11.204 ¹²⁴	45.06 ⁴²
29.2	56.618 ¹¹¹	32.47 ⁶⁷	18.236 ¹¹³	34.02 ⁶⁷	23.386 ²²⁸	60.60 ²⁹	11.076 ¹²⁸	44.44 ⁶²
July 9.2	56.511 ¹⁰⁷	33.07 ⁶⁰	18.127 ¹⁰⁹	34.62 ⁶⁰	23.155 ²³¹	59.90 ⁷⁰	10.950 ¹²⁶	43.60 ⁸⁴
	101	51	103	44	223	111	125	100
19.2	56.410	33.58	18.024	35.06	22.932	58.79	10.825	42.60
29.2	56.317 ⁹³	33.97 ³⁹	17.927 ⁹⁷	35.38 ³²	22.718 ²¹⁴	57.31 ¹⁴⁸	10.710 ¹¹⁵	41.45 ¹¹⁵
Aug. 8.1	56.239 ⁷⁸	34.22 ²⁵	17.846 ⁸¹	35.54 ¹⁶	22.529 ¹⁸⁹	55.49 ¹⁸²	10.607 ¹⁰³	40.21 ¹²⁴
18.1	56.178 ⁶¹	34.30 ⁸	17.781 ⁶⁵	35.55 ¹	22.366 ¹⁶³	53.39 ²¹⁰	10.519 ⁸⁸	38.88 ¹³³
28.1	56.134 ⁴⁴	34.23 ⁷	17.733 ⁴⁸	35.36 ¹⁹	22.242 ¹²⁴	51.10 ²²⁹	10.457 ⁶²	37.54 ¹³⁴
	15	26	19	40	81	242	37	131
Sept. 7.0	56.119	33.97	17.714	34.96	22.161	48.68	10.420	36.23
17.0	56.132 ¹³	33.47 ⁵⁰	17.720 ⁶	34.34 ⁶²	22.133 ²⁸	46.24 ²⁴⁴	10.418 ²	35.03 ¹²⁰
27.0	56.180 ⁴⁸	32.78 ⁶⁹	17.764 ⁴⁴	33.52 ⁸²	22.164 ³¹	43.86 ²³⁸	10.452 ³⁴	34.02 ¹⁰¹
Oct. 7.0	56.263 ⁸³	31.82 ⁹⁶	17.842 ⁷⁸	32.44 ¹⁰⁸	22.259 ⁹⁵	41.63 ²²³	10.531 ⁷⁹	33.21 ⁸¹
16.9	56.389 ¹²⁶	30.62 ¹²⁰	17.963 ¹²¹	31.13 ¹³¹	22.418 ¹⁵⁹	39.68 ¹⁹⁵	10.655 ¹²⁴	32.69 ⁵²
	164	141	160	153	224	160	169	19
26.9	56.553	29.21	18.123	29.60	22.642	38.08	10.824	32.50
Nov. 5.9	56.760 ²⁰⁷	27.53 ¹⁶⁸	18.325 ²⁰²	27.83 ¹⁷⁷	22.929 ²⁸⁷	36.89 ¹¹⁹	11.038 ²¹⁴	32.68 ¹⁸
15.9	57.003 ²¹³	25.67 ¹⁸⁶	18.564 ²³⁹	25.90 ¹⁹³	23.272 ³⁴³	36.21 ⁶⁸	11.290 ²⁵²	33.26 ⁵⁸
25.8	57.281 ²⁷⁸	23.66 ²⁰³	18.842 ²⁷⁸	23.81 ²⁰⁹	23.661 ³⁸⁹	36.07 ¹⁴	11.580 ²⁹⁰	34.21 ⁹⁵
Dec. 5.8	57.584 ³⁰³	21.53 ²¹³	19.144 ³⁰²	21.65 ²¹⁶	24.083 ⁴²²	36.48 ⁴¹	11.897 ³¹⁷	35.51 ¹³⁰
	320	214	318	217	444	96	335	166
15.8	57.904	19.39	19.462	19.48	24.527	37.44	12.232	37.17
25.7	58.231 ³²⁷	17.27 ²¹²	19.790 ³²⁸	17.37 ²¹¹	24.977 ⁴⁵⁰	38.91 ¹⁴⁷	12.574 ³⁴²	39.12 ¹⁹⁵
35.7	58.555 ³²⁴	15.26 ²⁰¹	20.114 ³²⁴	15.37 ²⁰⁰	25.417 ⁴⁴⁰	40.87 ¹⁹⁶	12.912 ³³⁸	41.31 ²¹⁹
Mean Place	55.625	37.27	17.249	37.87	21.570	37.62	9.698	29.81
Sec δ , Tan δ	1.008	+0.124	1.013	+0.161	1.565	-1.204	1.080	-0.408
$D\psi\alpha$, $D\omega\alpha$	+0.061	+0.008	+0.061	+0.011	+0.062	-0.080	+0.061	-0.027
$D\psi\delta$, $D\omega\delta$	-0.40	+0.01	-0.40	-0.01	-0.40	-0.02	-0.40	-0.03

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 H. Draconis. Mag. 5.1		δ Crucis. Mag. 3.1		δ Ursæ Majoris. Mag. 3.4		γ Corvi. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 8	° ' +78 2	h m 12 11	° ' -58 18	h m 12 11	° ' +57 27	h m 12 11	° ' -17 6
	s	"	s	"	s	"	s	"
Jan. 0.7	34.36	19.40	4.396	58.21	36.694	20.54	50.871	46.22
10.7	35.53 ¹¹⁷	19.27 ¹³	4.899 ⁵⁰³	60.26 ²⁰⁵	37.205 ⁵¹¹	19.80 ⁷⁴	51.199 ³²⁵	48.43 ²²¹
20.7	36.65 ¹¹²	19.79 ⁵²	5.369 ⁴⁷⁰	62.75 ²⁴⁹	37.696 ⁴⁹¹	19.66 ¹⁴	51.504 ³⁰⁵	50.70 ²²⁷
30.6	37.68 ¹⁰³	20.95 ¹¹⁶	5.790 ⁴²¹	65.59 ²⁸⁴	38.146 ⁴⁵⁰	20.11 ⁴⁵	51.781 ²⁷⁷	52.95 ²²⁵
Feb. 9.6	38.60 ⁹²	22.68 ¹⁷³	6.154 ³⁶⁴	68.71 ³¹²	38.543 ³⁹⁷	21.15 ¹⁰⁴	52.022 ²¹¹	55.13 ²¹⁸
	75	224	301	330	332	154	201	204
19.6	39.35 ⁵⁸	24.92 ²⁶²	6.455 ²³¹	72.01 ³³⁹	38.875 ²⁵⁹	22.69 ¹⁹⁹	52.223 ¹⁵⁹	57.17 ¹⁸⁸
Mar. 1.6	39.93 ³⁹	27.54 ²⁹⁵	6.686 ¹⁶⁵	75.40 ³¹²	39.134 ¹⁸²	24.68 ²³⁵	52.382 ¹¹⁷	59.05 ¹⁶⁷
11.5	40.32 ¹⁷	30.49 ³⁰⁹	6.851 ⁹⁸	78.82 ³³⁶	39.316 ¹⁰⁵	27.03 ²⁶⁰	52.499 ⁷⁷	60.72 ¹⁴⁵
21.5	40.49 ²	33.58 ³¹⁶	6.949 ³⁴	82.18 ³²⁴	39.421 ²⁸	29.63 ²⁷²	52.576 ⁴⁰	62.17 ¹²¹
31.5	40.47 ²¹	36.74 ³⁰⁸	6.983 ²⁵	85.42 ³⁰³	39.449 ⁴³	32.35 ²⁷⁴	52.616 ⁶	63.38 ⁹⁹
Apr. 10.5	40.26 ³⁸	39.82 ²⁸⁸	6.958 ⁸⁰	88.45 ²⁸⁰	39.406 ¹⁰⁵	35.09 ²⁶⁷	52.622 ²⁴	64.37 ⁷⁴
20.4	39.88 ⁵¹	42.70 ²⁵⁸	6.878 ¹²⁹	91.25 ²¹⁸	39.301 ¹⁶⁰	37.76 ²¹⁷	52.598 ⁴⁸	65.11 ⁵³
30.4	39.34 ⁶⁷	45.28 ²²²	6.749 ¹⁷²	93.73 ²¹⁴	39.141 ²⁰⁵	40.23 ²²²	52.550 ⁶⁹	65.64 ³⁰
May 10.4	38.67 ⁷⁷	47.50 ¹⁷⁶	6.577 ²¹¹	95.87 ¹⁷⁶	38.936 ²¹²	42.45 ¹⁸⁶	52.481 ⁸⁶	65.94 ¹⁰
20.3	37.90 ⁸⁴	49.26 ¹²⁵	6.366 ²⁴⁰	97.63 ¹³³	38.694 ²⁶⁴	44.31 ¹⁴⁸	52.395 ⁹⁸	66.04 ¹¹
30.3	37.06 ⁸⁹	50.51 ⁷³	6.126 ²⁶⁹	98.96 ⁸⁸	38.430 ²⁸¹	45.79 ¹⁰⁴	52.297 ¹⁰⁸	65.93 ³⁰
June 9.3	36.17 ⁹⁰	51.24 ¹⁶	5.857 ²⁸⁶	99.84 ⁴²	38.149 ²⁸⁹	46.83 ⁵⁸	52.189 ¹¹⁶	65.63 ⁴⁷
19.3	35.27 ⁹¹	51.40 ³⁷	5.571 ²⁹⁶	100.26 ⁶	37.860 ²⁸⁷	47.41 ⁹	52.073 ¹¹⁹	65.16 ⁶⁵
29.2	34.36 ⁸⁶	51.03 ⁹²	5.275 ³⁰²	100.20 ⁵²	37.573 ²⁷⁹	47.50 ³⁸	51.954 ¹²¹	64.51 ⁷⁹
July 9.2	33.50 ⁸²	50.11 ¹⁴⁴	4.973 ²⁹⁷	99.68 ⁹⁹	37.294 ²⁶²	47.12 ⁸⁴	51.833 ¹¹⁶	63.72 ⁹¹
19.2	32.68 ⁷⁵	48.67 ¹⁹⁴	4.676 ²⁸²	98.69 ¹⁴¹	37.032 ²³⁹	46.28 ¹²⁹	51.717 ¹¹¹	62.81 ¹⁰²
29.2	31.93 ⁶⁵	46.73 ²³⁷	4.394 ²⁵⁷	97.28 ¹⁸⁰	36.793 ²¹³	44.99 ¹⁷³	51.606 ¹⁰⁰	61.79 ¹⁰⁸
Aug. 8.1	31.28 ⁵⁵	44.36 ²⁷⁷	4.137 ²²²	95.48 ²¹⁵	36.580 ¹⁷⁶	43.26 ²¹¹	51.506 ⁸⁶	60.71 ¹¹²
18.1	30.73 ⁴⁴	41.59 ³⁰⁸	3.915 ¹⁷⁷	93.33 ²⁴¹	36.404 ¹³⁹	41.15 ²⁴⁵	51.420 ⁶⁴	59.59 ¹¹⁰
28.1	30.29 ³⁰	38.51 ³³⁹	3.738 ¹²²	90.92 ²⁵⁹	36.265 ⁹¹	38.70 ²⁷⁷	51.356 ³⁹	58.49 ¹⁰³
Sept. 7.0	29.99 ¹⁶	35.12 ³⁵⁸	3.616 ⁵⁹	88.33 ²⁶⁷	36.174 ³⁸	35.93 ³⁰³	51.317 ⁷	57.46 ⁹²
17.0	29.83 ¹	31.54 ³⁷⁰	3.557 ¹⁵	85.66 ²⁶⁶	36.136 ²²	32.90 ³²²	51.310 ²⁹	56.54 ⁷³
27.0	29.82 ¹⁵	27.84 ³⁷⁷	3.572 ⁹⁴	83.00 ²⁵³	36.158 ⁸²	29.68 ³³⁷	51.339 ⁷⁰	55.81 ⁵²
Oct. 7.0	29.97 ³¹	24.07 ³⁷⁶	3.666 ¹⁷¹	80.47 ¹⁹⁸	36.240 ²¹⁶	26.31 ³⁴⁴	51.409 ¹¹⁴	55.29 ²³
16.9	30.28 ⁴⁸	20.31 ³⁶³	3.837 ²⁵²	78.15 ¹⁵⁶	36.388 ²⁸⁴	22.87 ³¹⁴	51.523 ¹⁵⁹	55.06 ⁸
26.9	30.76 ⁶²	16.68 ³⁴²	4.089 ³²⁸	76.17 ¹⁰⁶	36.604 ³⁴⁶	19.43 ³³⁵	51.682 ²⁰³	55.14 ⁴²
Nov. 5.9	31.38 ⁷⁸	13.26 ³¹⁷	4.417 ³⁹³	74.61 ⁵²	36.888 ⁴⁰⁷	16.08 ³¹⁹	51.885 ²⁴⁴	55.56 ⁷⁸
15.9	32.16 ⁹²	10.09 ²⁷⁶	4.810 ⁴⁵²	73.55 ⁷	37.234 ⁴⁵⁵	12.89 ²⁹³	52.129 ²⁷⁹	56.34 ¹¹⁴
25.8	33.08 ¹⁰³	7.33 ²³²	5.262 ⁴⁹²	73.03 ⁶⁶	37.641 ⁴⁹¹	9.96 ²¹⁷	52.408 ³⁰⁹	57.48 ¹⁴⁵
Dec. 5.8	34.11 ¹¹²	5.01 ¹⁷⁹	5.754 ⁵¹⁷	73.10 ¹²²	38.096 ⁵¹⁵	7.37 ¹¹¹	52.717 ³²⁷	58.93 ²¹⁶
15.8	35.23 ¹¹⁷	3.22 ¹¹⁶	6.271 ⁵²⁵	73.76 ¹⁷⁶	38.587 ⁵²¹	5.20 ¹⁶⁹	53.044 ³³⁵	60.68 ¹⁹⁷
25.7	36.40 ¹¹⁹	2.06 ⁵⁶	6.796 ⁵¹⁷	74.98	39.102	3.51	53.379	62.65
35.7	37.59	1.50	7.313	76.74	39.623	2.40	53.711	64.81
Mean Place	36.701	38.64	3.130	75.69	37.514	37.41	50.598	51.85
Sec δ, Tan δ	4.826	+4.722	1.904	-1.620	1.859	+1.567	1.046	-0.308
Dψα, Dωα	+0.056	+0.314	+0.063	-0.108	+0.059	+0.104	+0.062	-0.020
Dψδ, Dωδ	-0.40	-0.04	-0.40	-0.05	-0.40	-0.05	-0.40	-0.05

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	2 Canum Venat. Mag. 5.8		β Chamæleontis. Mag. 4.4		η Virginis. Mag. 4.0		α^1 Crucis. Mag. 1.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 12	° ' " +41 4	h m 12 13	° ' " -78 52	h m 12 15	° ' " - 0 14	h m 12 22	° ' " -62 40
	s	"	s	"	s	"	s	"
Jan. 0.7	15.992	65.53 120	51.50 121	44.13 166	58.031 320	20.58 206	19.43 57	2.46 185
10.7	16.384 392	64.33 69	52.71 111	45.79 218	58.351 298	22.64 192	20.00 54	4.31 233
20.7	16.758 374	63.64 17	53.82 101	47.97 268	58.649 272	24.56 173	20.54 48	6.64 273
30.7	17.101 302	63.47 35	54.83 87	50.65 308	58.921 242	26.29 154	21.02 43	9.37 303
Feb. 9.6	17.403 253	63.82 83	55.70 71	53.73 338	59.163 202	27.83 125	21.45 36	12.40 329
19.6	17.656 200	64.65 127	56.41 54	57.11 362	59.365 163	29.08 98	21.81 28	15.69 313
Mar. 1.6	17.856 144	65.92 164	56.95 37	60.73 374	59.528 120	30.06 72	22.09 21	19.12 316
11.5	18.000 87	67.56 191	57.32 20	64.47 377	59.648 82	30.78 42	22.30 13	22.58 347
21.5	18.087 35	69.47 210	57.52 3	68.24 374	59.730 43	31.20 19	22.43 6	26.05 339
31.5	18.122 13	71.57 219	57.55 14	71.98 361	59.773 10	31.39 3	22.49 1	29.44 321
Apr. 10.5	18.109 57	73.76 220	57.41 30	75.59 344	59.783 17	31.36 19	22.48 8	32.65 300
20.4	18.052 92	75.96 210	57.11 44	79.03 315	59.766 43	31.17 36	22.40 13	35.65 272
30.4	17.960 122	78.06 194	56.67 57	82.18 281	59.723 62	30.81 51	22.27 19	38.37 236
May 10.4	17.838 145	80.00 172	56.10 70	84.99 241	59.661 79	30.30 58	22.08 23	40.73 201
20.4	17.693 161	81.72 144	55.40 80	87.40 198	59.582 93	29.72 64	21.85 27	42.74 160
30.3	17.532 171	83.16 111	54.60 88	89.38 151	59.489 98	29.08 66	21.58 31	44.34 110
June 9.3	17.361 176	84.27 76	53.72 94	90.89 97	59.391 107	28.42 71	21.27 33	45.44 66
19.3	17.185 177	85.03 38	52.78 98	91.86 40	59.284 110	27.71 71	20.94 35	46.10 16
29.2	17.008 173	85.41 2	51.80 99	92.26 13	59.174 110	27.00 69	20.59 36	46.26 34
July 9.2	16.835 162	85.43 37	50.81 97	92.13 67	59.064 107	26.31 65	20.23 36	45.92 80
19.2	16.673 151	85.06 74	49.84 93	91.46 123	58.957 103	25.66 63	19.87 34	45.12 128
29.2	16.522 133	84.32 111	48.91 85	90.23 169	58.854 91	25.03 51	19.53 32	43.84 171
Aug. 8.1	16.389 110	83.21 143	48.06 74	88.54 217	58.763 78	24.52 43	19.21 28	42.13 205
18.1	16.279 84	81.78 178	47.32 60	86.37 252	58.685 57	24.09 28	18.93 23	40.08 240
28.1	16.195 53	80.00 208	46.72 45	83.85 282	58.628 38	23.81 15	18.70 17	37.68 261
Sept. 7.1	16.142 15	77.92 234	46.27 25	81.03 302	58.590 4	23.66 7	18.53 9	35.07 273
17.0	16.127 26	75.58 237	46.02 6	78.01 310	58.586 25	23.73 28	18.44 1	32.34 278
27.0	16.153 72	73.01 276	45.96 15	74.91 304	58.611 66	24.01 53	18.43 7	29.56 268
Oct. 7.0	16.225 121	70.25 290	46.11 37	71.87 293	58.677 105	24.54 75	18.50 17	26.88 250
16.9	16.346 172	67.35 299	46.48 58	68.94 263	58.782 146	25.29 105	18.67 26	24.38 221
26.9	16.518 224	64.36 301	47.06 77	66.31 226	58.928 191	26.34 130	18.93 35	22.17 181
Nov. 5.9	16.742 272	61.35 296	47.83 94	64.05 176	59.119 230	27.64 154	19.28 42	20.36 133
15.9	17.014 317	58.39 283	48.77 107	62.29 122	59.349 265	29.18 178	19.70 50	19.03 81
25.8	17.331 355	55.56 261	49.84 118	61.07 81	59.614 295	30.96 195	20.20 54	18.22 21
Dec. 5.8	17.686 380	52.95 232	51.02 124	60.46 3	59.909 313	32.91 206	20.74 57	18.01 39
15.8	18.066 398	50.63 194	52.26 125	60.49 68	60.222 326	34.97 212	21.31 59	18.40 98
25.8	18.464 400	48.69 152	53.51 123	61.17 130	60.548 324	37.09 208	21.90 58	19.38 153
35.7	18.864	47.17	54.74	62.47	60.872	39.17	22.48	20.91
Mean Place	16.445	78.89	47.568	64.89	57.985	20.45	18.075	21.37
Sec δ , Tan δ	1.327	+0.872	5.188	-5.090	1.000	-0.004	2.178	-1.935
$D\psi\alpha$, $D\omega\alpha$	+0.060	+0.058	+0.069	-0.339	+0.061	0.000	+0.066	-0.128
$D\psi\delta$, $D\omega\delta$	-0.40	-0.05	-0.40	-0.06	-0.40	-0.07	-0.40	-0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	20 Comæ. Mag. 5.7		δ Corvi. Mag. 3.1		γ Crucis. Mag. 1.6		8 Canum Venat. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 25 s	° ' " +21 18 "	h m 12 25 s	° ' " -16 5 "	h m 12 26 s	° ' " -56 40 "	h m 12 30 s	° ' " +41 46 "
Jan. 0.7	51.063	73.32	52.849	6.98	53.876	37.37	4.871	19.37
10.7	51.400	71.58	53.176	9.15	54.372	39.27	5.265	18.05
20.7	51.722	70.17	53.486	11.34	54.839	41.59	5.647	17.21
30.7	52.019	69.15	53.770	13.51	55.265	44.29	6.000	16.93
Feb. 9.6	52.283	68.55	54.020	15.63	55.640	47.27	6.318	17.17
19.6	52.508	68.34	54.236	17.64	55.956	50.44	6.588	17.94
Mar. 1.6	52.690	68.53	54.408	19.45	56.211	53.72	6.809	19.14
11.6	52.829	69.08	54.541	21.05	56.400	57.04	6.973	20.75
21.5	52.923	69.92	54.631	22.44	56.527	60.33	7.083	22.67
31.5	52.974	71.02	54.687	23.63	56.593	63.50	7.137	24.81
Apr. 10.5	52.990	72.29	54.707	24.56	56.602	66.50	7.146	27.08
20.4	52.971	73.68	54.700	25.25	56.558	69.29	7.109	29.37
30.4	52.925	75.11	54.665	25.75	56.465	71.80	7.030	31.59
May 10.4	52.855	76.53	54.608	26.01	56.328	73.99	6.920	33.68
20.4	52.766	77.87	54.532	26.09	56.152	75.82	6.785	35.55
30.3	52.663	79.12	54.440	26.00	55.942	77.24	6.628	37.17
June 9.3	52.548	80.19	54.341	25.72	55.705	78.24	6.457	38.44
19.3	52.427	81.10	54.229	25.25	55.445	78.80	6.278	39.40
29.3	52.301	81.80	54.111	24.68	55.171	78.89	6.094	39.95
July 9.2	52.176	82.27	53.991	23.94	54.888	78.53	5.912	40.12
19.2	52.053	82.50	53.868	23.09	54.605	77.71	5.733	39.88
29.2	51.938	82.48	53.754	22.16	54.330	76.46	5.566	39.25
Aug. 8.1	51.832	82.22	53.648	21.16	54.075	74.83	5.413	38.24
18.1	51.741	81.68	53.554	20.14	53.844	72.84	5.278	36.87
28.1	51.669	80.91	53.479	19.14	53.662	70.59	5.170	35.16
Sept. 7.1	51.620	79.87	53.429	18.18	53.524	68.13	5.092	33.12
17.0	51.602	78.59	53.408	17.36	53.445	65.56	5.051	30.81
27.0	51.616	77.05	53.424	16.67	53.434	62.99	5.050	28.22
Oct. 7.0	51.671	75.26	53.480	16.23	53.497	60.50	5.095	25.42
17.0	51.765	73.27	53.582	16.04	53.638	58.21	5.192	22.47
26.9	51.905	71.08	53.725	16.15	53.856	56.22	5.339	19.42
Nov. 5.9	52.090	68.73	53.916	16.60	54.151	54.62	5.541	16.32
15.9	52.318	66.29	54.150	17.38	54.512	53.48	5.794	13.26
25.8	52.585	63.79	54.416	18.51	54.931	52.86	6.092	10.29
Dec. 5.8	52.886	61.34	54.718	19.93	55.397	52.82	6.434	7.55
15.8	53.210	58.98	55.039	21.64	55.894	53.33	6.806	5.11
25.8	53.548	56.79	55.372	23.56	56.402	54.41	7.199	2.99
35.7	53.890	54.85	55.704	25.68	56.908	56.02	7.595	1.35
Mean Place	51.324	80.45	52.676	12.89	52.865	55.26	5.470	32.25
Sec δ, Tan δ	1.074	+0.390	1.041	-0.288	1.821	-1.521	1.341	+0.893
D _α , D _ω	+0.060	+0.026	+0.062	-0.019	+0.066	-0.101	+0.058	+0.059
D _ψ δ, D _ω δ	-0.40	-0.11	-0.40	-0.11	-0.40	-0.12	-0.39	-0.13

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Draconis. Mag. 3.9		β Corvi. Mag. 2.8		24 Comæ seq. Mag. 5.2		α Muscæ. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 30	° ' " +70 12	h m 12 30	° ' " -22 58	h m 12 31	° ' " +18 47	h m 12 32	° ' " -68 42
	s	"	s	"	s	"	s	"
Jan. 0.7	10.63	27.19	20.517	7.53	15.831	56.34	35.99	21.02
10.7	11.38	26.56	20.854	9.69	16.164	54.53	36.69	22.63
20.7	12.12	26.56	21.175	11.94	16.484	53.02	37.36	24.76
30.7	12.81	27.19	21.471	14.26	16.779	51.89	37.97	27.33
Feb. 9.6	13.43	28.46	21.731	16.57	17.044	51.15	38.51	30.27
19.6	13.96	30.30	21.956	18.82	17.269	50.81	38.97	33.50
Mar. 1.6	14.38	32.59	22.137	20.93	17.454	50.85	39.34	36.94
11.6	14.69	35.22	22.278	22.92	17.595	51.24	39.61	40.49
21.5	14.88	38.14	22.378	24.68	17.695	51.94	39.80	44.06
31.5	14.94	41.18	22.436	26.24	17.752	52.88	39.89	47.59
Apr. 10.5	14.89	44.23	22.465	27.57	17.774	54.03	39.90	51.00
20.4	14.74	47.18	22.459	28.69	17.762	55.30	39.82	54.23
30.4	14.48	49.92	22.427	29.56	17.723	56.64	39.66	57.21
May 10.4	14.14	52.36	22.370	30.18	17.661	57.98	39.44	59.87
20.4	13.74	54.41	22.294	30.56	17.578	59.27	39.14	62.15
30.3	13.28	56.05	22.202	30.73	17.481	60.47	38.80	64.03
June 9.3	12.78	57.18	22.094	30.67	17.372	61.54	38.40	65.45
19.3	12.27	57.78	21.976	30.38	17.255	62.46	37.97	66.39
29.3	11.74	57.85	21.850	29.87	17.134	63.20	37.50	66.83
July 9.2	11.23	57.37	21.720	29.20	17.011	63.72	37.03	66.74
19.2	10.74	56.40	21.590	28.32	16.890	64.04	36.55	66.13
29.2	10.27	54.94	21.462	27.27	16.774	64.12	36.08	65.03
Aug. 8.1	9.86	52.97	21.344	26.12	16.668	63.96	35.65	63.45
18.1	9.49	50.60	21.240	24.88	16.574	63.56	35.26	61.47
28.1	9.18	47.84	21.154	23.61	16.499	62.91	34.93	59.11
Sept. 7.1	8.96	44.78	21.099	22.35	16.447	62.03	34.68	56.48
17.0	8.81	41.43	21.069	21.16	16.423	60.90	34.52	53.67
27.0	8.75	37.86	21.078	20.11	16.432	59.50	34.47	50.78
Oct. 7.0	8.79	34.19	21.131	19.23	16.481	57.86	34.52	47.91
17.0	8.93	30.45	21.231	18.65	16.570	55.99	34.70	45.18
26.9	9.18	26.76	21.376	18.33	16.702	53.94	34.99	42.70
Nov. 5.9	9.53	23.18	21.569	18.39	16.880	51.69	35.39	40.60
15.9	9.98	19.81	21.807	18.80	17.102	49.33	35.89	38.94
25.8	10.53	16.73	22.084	19.62	17.363	46.90	36.47	37.81
Dec. 5.8	11.16	14.04	22.391	20.76	17.658	44.47	37.13	37.27
15.8	11.85	11.84	22.723	22.27	17.975	42.12	37.82	37.34
25.8	12.59	10.17	23.065	24.07	18.308	39.90	38.54	38.03
35.7	13.35	9.14	23.411	26.11	18.646	37.90	39.26	39.30
Mean Place	12.375	45.08	20.283	16.00	16.094	62.42	34.353	41.42
Sec δ , Tan δ	2.954	+2.779	1.086	-0.424	1.056	+0.340	2.754	-2.566
$D\psi\alpha$, $D\omega\alpha$	+0.051	+0.184	+0.063	-0.028	+0.060	+0.022	+0.071	-0.169
$D\psi\delta$, $D\omega\delta$	-0.39	-0.13	-0.39	-0.13	-0.39	-0.14	-0.39	-0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	χ Virginis. Mag. 4.8		γ Centauri. Mag. 2.4		γ Virginis (mean). Mag. 2.9		ρ Virginis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 35 s	° ' " - 7 34 "	h m 12 37 s	° ' " -48 31 "	h m 12 37 s	° ' " - 1 1 "	h m 12 37 s	° ' " +10 39 "
Jan. 0.7	16.217	16.10	16.371	57.44	45.458	37.19	59.065	31.58
10.7	16.540	18.19	16.807	59.34	45.778	39.25	59.390	29.61
20.7	16.847	20.24	17.218	61.61	46.084	41.20	59.704	27.89
30.7	17.132	22.20	17.597	64.18	46.368	42.98	59.993	26.45
Feb. 9.6	17.385	24.01	17.932	66.99	46.622	44.53	60.255	25.35
19.6	17.603	25.60	18.222	69.94	46.840	45.84	60.478	24.59
Mar. 1.6	17.782	26.97	18.458	72.97	47.020	46.87	60.663	24.18
11.6	17.922	28.09	18.640	76.00	47.161	47.62	60.809	24.09
21.5	18.022	28.97	18.771	78.96	47.262	48.11	60.911	24.31
31.5	18.086	29.60	18.850	81.80	47.327	48.34	60.978	24.77
Apr. 10.5	18.116	30.02	18.881	84.48	47.358	48.35	61.008	25.46
20.4	18.117	30.22	18.868	86.93	47.360	48.16	61.007	26.31
30.4	18.092	30.24	18.814	89.11	47.335	47.82	60.979	27.25
May 10.4	18.045	30.10	18.725	91.01	47.289	47.36	60.928	28.26
20.4	17.979	29.81	18.602	92.57	47.223	46.80	60.859	29.29
30.3	17.899	29.42	18.452	93.77	47.143	46.16	60.773	30.29
June 9.3	17.806	28.92	18.277	94.59	47.051	45.49	60.677	31.25
19.3	17.704	28.32	18.083	95.02	46.950	44.78	60.571	32.12
29.3	17.595	27.67	17.874	95.03	46.842	44.08	60.459	32.87
July 9.2	17.481	26.96	17.657	94.64	46.729	43.40	60.342	33.49
19.2	17.367	26.23	17.437	93.87	46.616	42.75	60.227	33.98
29.2	17.255	25.48	17.220	92.70	46.505	42.14	60.115	34.31
Aug. 8.1	17.150	24.75	17.016	91.21	46.400	41.61	60.011	34.44
18.1	17.057	24.07	16.831	89.41	46.306	41.17	59.918	34.40
28.1	16.981	23.45	16.676	87.39	46.229	40.85	59.841	34.16
Sept. 7.1	16.926	22.95	16.559	85.19	46.173	40.69	59.786	33.71
17.0	16.900	22.59	16.491	82.91	46.145	40.70	59.757	33.02
27.0	16.907	22.42	16.476	80.64	46.148	40.93	59.761	32.11
Oct. 7.0	16.951	22.47	16.518	78.47	46.189	41.38	59.804	30.94
17.0	17.038	22.79	16.629	76.50	46.272	42.09	59.886	29.54
26.9	17.170	23.39	16.805	74.81	46.398	43.06	60.011	27.89
Nov. 5.9	17.346	24.27	17.046	73.50	46.569	44.30	60.182	26.03
15.9	17.564	25.45	17.346	72.62	46.782	45.79	60.394	24.00
25.8	17.822	26.89	17.698	72.23	47.034	47.50	60.645	21.83
Dec. 5.8	18.110	28.59	18.093	72.36	47.316	49.41	60.930	19.58
15.8	18.422	30.48	18.516	73.01	47.623	51.45	61.239	17.31
25.8	18.746	32.50	18.956	74.18	47.944	53.55	61.564	15.10
35.7	19.073	34.61	19.394	75.81	48.269	55.65	61.892	13.00
Mean Place	16.201	19.38	15.733	73.90	45.530	38.25	59.272	34.61
Sec δ , Tan δ	1.009	-0.133	1.510	-1.132	1.000	-0.018	1.018	+0.188
$D\psi\alpha$, $D\omega\alpha$	+0.062	-0.009	+0.066	-0.074	+0.061	-0.001	+0.060	+0.012
$D\psi\delta$, $D\omega\delta$	-0.39	-0.15	-0.39	-0.16	-0.39	-0.16	-0.39	-0.16

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	76 Ursæ Majoris. Mag. 5.9			β Crucis. Mag. 1.5			31 Comæ. Mag. 5.1			η Centauri. Mag. 4.3		
	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.	Right Ascension.		Declina- tion.
	h m 12 38	° ' "	° ' "	h m 12 43	° ' "	° ' "	h m 12 47	° ' "	° ' "	h m 12 49	° ' "	° ' "
	s	"	"	s	"	"	s	"	"	s	"	"
Jan. 0.8	11.07	51.43	93	13.476	46.34	165	56.460	25.43	178	10.299	22.97	188
10.7	11.66	50.50	30	14.010	47.99	212	56.809	23.65	135	10.690	24.85	219
20.7	12.24	50.20	34	14.520	50.11	251	57.150	22.30	92	11.064	27.04	243
30.7	12.78	50.54	94	14.992	52.62	284	57.469	21.38	45	11.412	29.47	258
Feb. 9.6	13.27	51.48	153	15.414	55.46	308	57.757	20.93	1	11.724	32.05	267
19.6	13.70	53.01	201	15.778	58.54	321	58.009	20.94	46	11.998	34.72	271
Mar. 1.6	14.04	55.02	242	16.076	61.75	331	58.222	21.40	85	12.225	37.43	286
11.6	14.30	57.44	269	16.310	65.06	331	58.386	22.25	117	12.405	40.09	258
21.5	14.47	60.13	289	16.479	68.37	324	58.510	23.42	145	12.541	42.67	243
31.5	14.55	63.02	295	16.582	71.61	312	58.586	24.87	166	12.633	45.10	224
Apr. 10.5	14.54	65.97	289	16.622	74.73	293	58.623	26.53	176	12.682	47.34	204
20.5	14.45	68.86	274	16.603	77.66	268	58.621	28.29	107	12.694	49.38	180
30.4	14.29	71.60	247	16.530	80.34	237	58.588	30.07	176	12.670	51.18	153
May 10.4	14.07	74.07	215	16.407	82.71	204	58.526	31.83	164	12.616	54.71	124
20.4	13.80	76.22	173	16.239	84.75	164	58.442	33.47	151	12.533	53.95	94
30.3	13.49	77.95	129	16.030	86.39	123	58.338	34.98	130	12.426	54.89	60
June 9.3	13.15	79.24	82	15.786	87.62	80	58.219	36.28	107	12.296	55.49	28
19.3	12.79	80.06	31	15.513	88.42	33	58.089	37.35	81	12.147	55.77	8
29.3	12.42	80.37	21	15.218	88.75	14	57.953	38.16	49	11.986	55.69	40
July 9.2	12.05	80.16	70	14.909	88.61	62	57.811	38.65	23	11.813	55.29	73
19.2	11.70	79.46	119	14.596	87.99	105	57.670	38.88	10	11.636	54.56	103
29.2	11.36	78.27	167	14.285	86.94	147	57.530	38.78	43	11.459	53.53	133
Aug. 8.2	11.06	76.60	208	13.993	85.47	187	57.401	38.35	70	11.289	52.20	151
18.1	10.79	74.52	249	13.726	83.60	216	57.285	37.65	104	11.132	50.66	174
28.1	10.56	72.03	283	13.500	81.44	212	57.186	36.61	130	10.999	48.92	185
Sept. 7.1	10.38	69.20	311	13.321	79.02	257	57.109	35.31	163	10.896	47.07	190
17.0	10.27	66.09	336	13.206	76.45	263	57.062	33.68	187	10.831	45.17	188
27.0	10.22	62.73	352	13.163	73.82	258	57.049	31.81	212	10.809	43.29	176
Oct. 7.0	10.24	59.21	363	13.197	71.24	243	57.077	29.69	235	10.840	41.53	158
17.0	10.34	55.58	363	13.315	68.81	218	57.147	27.34	251	10.927	39.95	128
26.9	10.52	51.95	358	13.519	66.63	182	57.264	24.80	266	11.071	38.67	95
Nov. 5.9	10.79	48.37	342	13.803	64.81	139	57.429	22.14	273	11.273	37.72	54
15.9	11.13	44.95	317	14.166	63.42	91	57.644	19.41	276	11.531	37.18	9
25.9	11.55	41.78	282	14.594	62.51	481	57.899	16.65	268	11.835	37.09	37
Dec. 5.8	12.03	38.96	241	15.075	62.18	23	58.194	13.97	253	12.181	37.46	83
15.8	12.57	36.55	189	15.595	62.41	80	58.516	11.44	229	12.554	38.29	127
25.8	13.14	34.66	134	16.135	63.21	131	58.860	9.15	202	12.945	39.56	168
35.7	13.74	33.32		16.675	64.55		59.214	7.13		13.340	41.24	
Mean Place	12.429	68.16		12.560	65.49		56.948	33.71		9.948	37.51	
Sec δ , Tan δ	2.213	+1.974		1.957	-1.682		1.132	+0.531		1.301	-0.832	
$D\psi\alpha$, $D\omega\alpha$	+0.052	+0.130		+0.070	-0.110		+0.058	+0.035		+0.066	-0.054	
$D\psi\delta$, $D\omega\delta$	-0.39	-0.17		-0.39	-0.19		-0.39	-0.21		-0.39	-0.21	

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Ursæ Majoris. (Alioth.) Mag. 1.7		δ Virginis. Mag. 3.7		α Can. Ven. seq. Mag. 2.9		δ Muscæ. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	12 50	+56 22	12 51	+ 3 48	12 52	+38 43	12 56	-71 7
	s	"	s	"	s	"	s	"
Jan. 0.8	37.644	23.91	43.225	56.12	25.015	50.97	58.12	40.28
10.7	38.144 500	22.66 125	43.546 321	54.07 205	25.398 383	49.34 163	58.92 80	41.50 122
20.7	38.634 490	22.02 64	43.858 312	52.20 187	25.770 372	48.24 110	59.69 77	43.27 177
30.7	39.099 465	22.00 2	44.148 290	50.56 164	26.123 353	47.65 59	60.41 72	45.52 225
Feb. 9.6	39.523 424	22.59 59	44.412 264	49.16 140	26.445 322	47.59 6	61.07 66	48.19 267
19.6	39.896 373	23.76 117	44.641 229	48.06 110	26.727 282	48.04 45	61.64 57	51.20 301
Mar. 1.6	40.205 309	25.44 168	44.834 193	47.26 80	26.962 235	48.99 95	62.11 47	54.45 325
11.6	40.445 240	27.55 211	44.990 156	46.78 48	27.147 185	50.34 135	62.50 39	57.88 343
21.5	40.613 168	30.01 246	45.105 115	46.57 21	27.283 136	52.07 173	62.78 28	61.42 354
31.5	40.709 96	32.68 267	45.185 80	46.64 7	27.366 83	54.06 199	62.97 19	64.97 355
Apr. 10.5	40.734 25	35.47 279	45.228 43	46.93 29	27.405 213	56.19 213	63.06 9	68.43 346
20.5	40.694 40	38.27 280	45.243 15	47.41 18	27.399 6	58.43 221	63.04 2	71.78 335
30.4	40.596 98	40.98 271	45.230 13	48.03 62	27.353 46	60.65 222	62.94 10	74.92 314
May 10.4	40.447 149	43.47 249	45.194 36	48.75 72	27.274 79	62.80 215	62.75 19	77.81 289
20.4	40.256 191	45.70 223	45.137 57	49.54 79	27.167 107	64.77 197	62.48 27	80.36 255
30.3	40.028 228	47.57 187	45.063 74	50.36 82	27.038 129	66.49 172	62.14 34	82.53 217
June 9.3	39.776 252	49.05 148	44.975 88	51.18 82	26.890 118	67.95 146	61.72 42	84.28 175
19.3	39.507 269	50.08 103	44.876 99	51.97 79	26.727 103	69.10 115	61.26 46	85.57 129
29.3	39.225 282	50.66 58	44.769 107	52.72 75	26.558 169	69.87 77	60.75 51	86.36 79
July 9.2	38.941 284	50.73 7	44.654 115	53.40 68	26.383 175	70.28 41	60.22 53	86.62 26
19.2	38.661 280	50.33 40	44.538 116	54.00 60	26.209 171	70.29 1	59.67 55	86.37 25
29.2	38.392 269	49.45 88	44.423 115	54.49 49	26.041 168	69.93 36	59.13 51	85.60 77
Aug. 8.2	38.141 251	48.14 131	44.312 111	54.89 40	25.881 160	69.20 73	58.60 53	84.34 126
18.1	37.915 226	46.37 177	44.209 103	55.12 23	25.735 146	68.07 113	58.60 48	82.61 173
28.1	37.721 194	44.21 216	44.122 87	55.22 10	25.612 123	66.62 145	57.70 42	80.47 214
Sept. 7.1	37.566 155	41.68 253	44.056 66	55.12 10	25.512 100	64.80 182	57.36 34	78.00 247
17.0	37.458 108	38.83 285	44.013 13	54.83 29	25.448 61	62.70 210	57.11 25	75.28 272
27.0	37.402 56	35.72 311	44.005 8	54.32 51	25.419 29	60.28 242	56.97 14	72.41 287
Oct. 7.0	37.406 4	32.40 332	44.031 26	53.57 75	25.436 17	57.66 262	56.96 1	69.49 292
17.0	37.476 70	28.93 347	44.099 68	52.58 99	25.500 64	54.80 286	57.09 13	66.64 285
26.9	37.614 138	25.40 353	44.211 112	51.34 124	25.617 117	51.80 300	57.34 25	63.99 265
Nov. 5.9	37.822 208	21.86 351	44.368 157	49.85 149	25.786 169	48.72 308	57.72 38	61.63 236
15.9	38.098 276	18.41 345	44.567 199	48.13 172	26.007 221	45.63 309	58.22 50	59.67 196
25.9	38.441 343	15.15 326	44.807 240	46.22 191	26.278 271	42.60 303	58.84 62	58.20 147
Dec. 5.8	38.838 397	12.19 290	45.082 275	44.17 205	26.590 312	39.73 287	59.53 69	57.29 91
15.8	39.285 447	9.59 266	45.383 301	42.03 214	26.938 318	37.08 265	60.29 76	56.96 33
25.8	39.766 481	7.44 215	45.700 317	39.87 216	27.308 370	34.79 229	61.08 79	57.24 28
35.7	40.264 498	5.83 161	46.024 324	37.75 212	27.691 383	32.85 194	61.88 80	58.12 88
Mean Place	38.817	39.03	43.434	56.19	25.715	62.12	56.736	61.95
Sec δ, Tan δ	1.806	+1.504	1.002	+0.067	1.282	+0.802	3.093	-2.927
D _α , D _{ωα}	+0.052	+0.098	+0.061	+0.004	+0.056	+0.052	+0.080	-0.189
D _δ , D _{ωδ}	-0.39	-0.22	-0.39	-0.22	-0.39	-0.23	-0.39	-0.25

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Virginis. Mag. 3.0		θ Virginis. Mag. 4.4		43 Comæ. Mag. 4.3		20 Canum Venat. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 12 58 s	° ' " +11 22 "	h m 13 5 s	° ' " - 5 7 "	h m 13 8 s	° ' " +28 15 "	h m 13 14 s	° ' " +40 58 "
Jan. 0.8	20.298	19.21	57.460	38.16	16.311	57.86	4.720	28.96
10.7	20.623 ³²⁵	17.20 ²⁰¹	57.783 ³²³	40.22 ²⁰⁶	16.659 ³⁴⁸	55.99 ¹⁸⁷	5.108 ³⁸⁸	27.18 ¹⁷⁸
20.7	20.940 ³¹⁷	15.45 ¹⁷⁵	58.099 ³¹⁶	42.20 ¹⁹⁸	17.002 ³⁴³	54.51 ¹⁴⁸	5.494 ³⁸⁶	25.91 ¹²⁷
30.7	21.238 ²⁹⁸	13.98 ¹⁴⁷	58.396 ²⁹⁷	44.07 ¹⁸⁷	17.329 ³²⁷	53.48 ¹⁰³	5.864 ³⁷⁰	25.17 ⁷⁴
Feb. 9.7	21.510 ²⁷²	12.86 ¹¹²	58.667 ²⁷¹	45.76 ¹⁶⁹	17.629 ³⁰⁰	52.95 ⁵³	6.206 ³⁴²	25.00 ¹⁷
	238 ⁷⁸		240 ¹⁴⁷		266 ⁶		307 ³⁸	
19.6	21.748	12.08	58.907	47.23	17.895	52.89	6.513	25.38
Mar. 1.6	21.950 ²⁰²	11.66 ⁴²	59.115 ²⁰⁸	48.44 ¹²¹	18.121 ²²⁶	53.29 ⁴⁰	6.776 ²⁶³	26.28 ⁹⁰
11.6	22.114 ¹⁶⁴	11.60 ⁶	59.281 ¹⁶⁶	49.45 ¹⁰¹	18.306 ¹⁸⁵	54.11 ⁸²	6.990 ²¹⁴	27.65 ¹³⁷
21.6	22.237 ¹²³	11.83 ²³	59.414 ¹³³	50.16 ⁷¹	18.446 ¹⁴⁰	55.28 ¹¹⁷	7.154 ¹⁶⁴	29.41 ¹⁷⁶
31.5	22.324 ⁸⁷	12.34 ⁵¹	59.509 ⁹⁵	50.63 ⁴⁷	18.546 ¹⁰⁰	56.75 ¹⁴⁷	7.266 ¹¹²	31.46 ²⁰⁵
	49 ⁷⁶		62 ²¹		55 ¹⁷¹		64 ²²⁶	
Apr. 10.5	22.373	13.10	59.571	50.87	18.601	58.46	7.330	33.72
20.5	22.394 ²¹	14.01 ⁹¹	59.602 ³¹	50.92 ⁵	18.621 ²⁰	60.30 ¹⁸⁴	7.348 ¹⁸	36.10 ²³⁸
30.4	22.382 ¹²	15.05 ¹⁰⁴	59.607 ⁵	50.79 ¹³	18.604 ¹⁷	62.20 ¹⁹⁰	7.324 ²⁴	38.48 ²³⁸
May 10.4	22.349 ³³	16.16 ¹¹¹	59.584 ²³	50.50 ²⁹	18.560 ⁴⁴	64.08 ¹⁸⁸	7.262 ⁶²	40.80 ²³²
20.4	22.291 ⁵⁸	17.28 ¹¹²	59.542 ⁴²	50.10 ⁴⁰	18.489 ¹⁸⁰	65.88 ¹⁹⁰	7.168 ⁹⁴	42.95 ²¹⁵
	76 ¹⁰⁹		63 ⁵¹		92 ¹⁶⁵		122 ¹⁹⁴	
30.4	22.215	18.37	59.479	49.59	18.397	67.53	7.046	44.89
June 9.3	22.126 ⁸⁹	19.39 ¹⁰²	59.401 ⁷⁸	49.05 ⁵⁴	18.285 ¹¹²	68.99 ¹⁴⁶	6.901 ¹⁴⁵	46.54 ¹⁶⁵
19.3	22.025 ¹⁰¹	20.35 ⁹⁶	59.309 ⁹²	48.42 ⁶³	18.159 ¹²⁶	70.22 ¹²³	6.738 ¹⁶³	47.86 ¹³²
29.3	21.913 ¹¹²	21.17 ⁸²	59.204 ¹⁰⁵	47.76 ⁶⁶	18.022 ¹³⁷	71.19 ⁹⁷	6.563 ¹⁷⁵	48.82 ⁹⁶
July 9.3	21.795 ¹¹⁸	21.85 ⁶⁸	59.091 ¹¹³	47.08 ⁶⁸	17.876 ¹⁴⁶	71.85 ⁶⁶	6.378 ¹⁸⁵	49.39 ⁵⁷
	121 ⁵²		118 ⁶⁷		149 ³⁶		189 ¹⁶	
19.2	21.674	22.37	58.973	46.41	17.727	72.21	6.189	49.55
29.2	21.553 ¹²¹	22.72 ³⁵	58.853 ¹²⁰	45.77 ⁶⁴	17.579 ¹⁴⁸	72.24 ³	6.001 ¹⁸⁸	49.32 ²³
Aug. 8.2	21.436 ¹¹⁷	22.90 ¹⁸	58.737 ¹¹⁶	45.16 ⁶¹	17.435 ¹⁴⁴	71.97 ²⁷	5.819 ¹⁸²	48.68 ⁶⁴
18.1	21.329 ¹⁰⁷	22.87 ³	58.627 ¹¹⁰	44.60 ⁵⁶	17.302 ¹³³	71.34 ⁶³	5.649 ¹⁷⁰	47.63 ¹⁰⁵
28.1	21.235 ⁹⁴	22.62 ²⁵	58.528 ⁹⁹	44.14 ⁴⁶	17.183 ¹¹⁹	70.42 ⁹²	5.496 ¹⁵³	46.22 ¹⁴¹
	76 ⁴⁶		77 ³⁷		100 ¹²³		128 ¹⁷⁹	
Sept. 7.1	21.159	22.16	58.451	43.77	17.083	69.19	5.368	44.43
17.1	21.110 ⁴⁹	21.46 ⁷⁰	58.394 ⁵⁷	43.58 ¹⁹	17.012 ⁷¹	67.65 ¹⁵⁴	5.270 ⁹⁸	42.29 ²¹⁴
27.0	21.094 ¹⁶	20.50 ⁹⁶	58.375 ¹⁹	43.58 ⁰	16.973 ³⁹	65.82 ¹⁸³	5.210 ⁶⁰	39.87 ²⁴²
Oct. 7.0	21.113 ¹⁹	19.33 ¹¹⁷	58.388 ¹³	43.80 ²²	16.974 ¹	63.72 ²¹⁰	5.194 ¹⁶	37.16 ²⁷¹
17.0	21.175 ⁶²	17.88 ¹⁴⁵	58.445 ⁵⁷	44.24 ⁴⁴	17.019 ⁴⁵	61.89 ²³³	5.227 ³³	34.24 ²⁹²
	105 ¹⁶⁸		102 ⁶⁹		92 ²⁵²		87 ³¹⁰	
26.9	21.280	16.20	58.547	44.93	17.111	58.87	5.314	31.14
Nov. 5.9	21.430 ¹⁵⁰	14.32 ¹⁸⁸	58.694 ¹⁴⁷	45.89 ⁹⁶	17.252 ¹⁴¹	56.19 ²⁶⁸	5.457 ¹⁴³	27.94 ³²⁰
15.9	21.623 ¹⁹³	12.24 ²⁰⁸	58.887 ¹⁹³	47.15 ¹²⁶	17.442 ¹⁹⁰	53.41 ²⁷⁸	5.655 ¹⁹⁸	24.71 ³²³
25.9	21.860 ²³⁷	10.03 ²²¹	59.119 ²³²	48.64 ¹⁴⁹	17.679 ²³⁷	50.61 ²⁸⁰	5.906 ²⁵¹	21.53 ³¹⁸
Dec. 5.8	22.130 ²⁷⁰	7.74 ²²⁹	59.388 ²⁶⁹	50.35 ¹⁷¹	17.958 ²⁷⁹	47.86 ²⁷⁵	6.206 ³⁰⁰	18.49 ³⁰⁴
	300 ²³¹		299 ¹⁸⁹		309 ²⁶³		340 ²⁸¹	
15.8	22.430	5.43	59.687	52.24	18.267	45.23	6.546	15.68
25.8	22.749 ³¹⁹	3.17 ²²⁶	60.003 ³¹⁶	54.23 ¹⁹⁹	18.603 ³³⁶	42.84 ²³⁹	6.914 ³⁶⁸	13.20 ²⁴⁸
35.8	23.076 ³²⁷	1.04 ²¹³	60.327 ³²⁴	56.29 ²⁰⁶	18.951 ³⁴⁸	40.73 ²¹¹	7.301 ³⁸⁷	11.13 ²⁰⁷
Mean Place	20.632	21.64	57.657	41.85	16.932	65.32	5.617	39.64
Sec δ, Tan δ	1.020	+0.201	1.004	-0.090	1.135	+0.538	1.324	+0.868
Dψα, Dωα	+0.060	+0.013	+0.062	-0.006	+0.057	+0.034	+0.054	+0.055
Dψδ, Dωδ	-0.39	-0.25	-0.38	-0.28	-0.38	-0.29	-0.38	-0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Hydræ. Mag. 3.3		ι Centauri. Mag. 2.9		ζ^1 Ursæ Majoris. (Mizar.) Mag. 2.4		α Virginis. (Spica.) Mag. 1.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	13 14	-22 45	13 16	-36 18	13 20	+55 19	13 21	-10 45
	s	"	s	"	s	"	s	"
Jan. 0.8	43.812	46.38	15.723	9.23	48.377	24.19	7.806	29.01
10.7	44.156 ³⁴⁴	48.26 ¹⁸⁸	16.103 ³⁸⁰	10.92 ¹⁶⁹	48.856 ⁴⁷⁹	22.56 ¹⁶³	8.133 ³²⁷	30.99 ¹⁹⁸
20.7	44.491 ³³⁵	50.28 ²⁰²	16.475 ³⁷²	12.87 ¹⁹⁵	49.336 ⁴⁸⁰	21.54 ¹⁰²	8.454 ³²¹	32.97 ¹⁹⁸
30.7	44.809 ³¹⁸	52.39 ²¹¹	16.825 ³⁵⁰	15.07 ²²⁰	49.803 ⁴⁶⁷	21.13 ⁴¹	8.759 ³⁰⁵	34.90 ¹⁹³
Feb. 9.7	45.100 ²⁹¹	54.50 ²¹¹	17.149 ³²¹	17.40 ²³³	50.240 ⁴³⁷	21.37 ²⁴	9.042 ²⁸³	36.71 ¹⁸¹
	260	207	286	241	393	84	254	166
19.6	45.360	56.57	17.435	19.81	50.633	22.21	9.296	38.37
Mar. 1.6	45.584 ²²⁴	58.54 ¹⁹⁷	17.684 ²⁴⁹	22.25 ²⁴⁴	50.973 ³¹⁰	23.59 ¹³⁸	9.514 ²¹⁸	39.84 ¹⁴⁷
11.6	45.770 ¹⁸⁶	60.38 ¹⁸⁴	17.891 ²⁰⁷	24.66 ²⁴¹	51.250 ²⁷⁷	25.49 ¹⁹⁰	9.699 ¹⁸⁵	41.07 ¹²³
21.6	45.920 ¹⁵⁰	62.05 ¹⁶⁷	18.054 ¹⁶³	26.98 ²³²	51.462 ²¹²	27.77 ²²⁸	9.847 ¹⁴⁸	42.08 ¹⁰¹
31.5	46.030 ¹¹⁰	63.55 ¹⁵⁰	18.178 ¹²⁴	29.19 ²²¹	51.606 ¹⁴⁴	30.36 ²⁵⁹	9.958 ¹¹¹	42.86 ⁷⁸
	76	128	85	205	76	276	80	60
Apr. 10.5	46.106	64.83	18.263	31.24	51.682	33.12	10.038	43.46
20.5	46.150 ⁴⁴	65.93 ¹¹⁰	18.309 ⁴⁶	33.11 ¹⁸⁷	51.693 ¹¹	35.97 ²⁸⁵	10.085 ⁴⁷	43.83 ³⁷
30.4	46.164 ¹¹	66.82 ⁸⁹	18.322 ¹³	34.76 ¹⁶⁵	51.645 ⁴⁸	38.77 ²⁸⁰	10.106 ²¹	44.02 ¹⁹
May 10.4	46.151 ¹³	67.52 ⁷⁰	18.301 ²¹	36.19 ¹⁴³	51.544 ¹⁰¹	41.46 ²⁶⁹	10.098 ⁸	44.04 ²
20.4	46.113 ³⁸	67.99 ⁴⁷	18.254 ⁴⁷	37.36 ¹¹⁷	51.394 ¹⁵⁰	43.91 ²⁴⁵	10.070 ²⁸	43.91 ¹³
	61	30	77	91	190	215	52	26
30.4	46.052	68.29	18.177	38.30	51.204	46.06	10.018	43.65
June 9.3	45.971 ⁸¹	68.38 ⁹	18.077 ¹⁰⁰	38.93 ⁶³	50.982 ²²²	47.84 ¹⁷⁸	9.947 ⁷¹	43.30 ³⁵
19.3	45.875 ⁹⁶	68.27 ¹¹	17.954 ¹²³	39.28 ³⁵	50.733 ²¹⁹	49.23 ¹³⁹	9.861 ⁸⁶	42.83 ⁴⁷
29.3	45.761 ¹¹¹	67.99 ²⁸	17.813 ¹¹¹	39.33 ⁵	50.467 ²⁶⁶	50.15 ⁹²	9.760 ¹⁰¹	42.32 ⁵¹
July 9.3	45.636 ¹²⁵	67.51 ⁴⁸	17.657 ¹⁵⁶	39.09 ²¹	50.187 ²⁸⁰	50.60 ⁴⁵	9.646 ¹¹⁴	41.71 ⁶¹
	135	64	166	53	283	3	121	66
19.2	45.501	66.87	17.491	38.56	49.904	50.57	9.525	41.05
29.2	45.362 ¹³⁹	66.08 ⁷⁹	17.319 ¹⁷²	37.75 ⁸¹	49.623 ²⁸¹	50.05 ⁵²	9.399 ¹²⁶	40.35 ⁷⁰
Aug. 8.2	45.225 ¹³⁷	65.16 ⁹²	17.149 ¹⁷⁰	36.69 ¹⁰⁶	49.351 ²⁷²	49.06 ⁹⁹	9.271 ¹²⁸	39.65 ⁷⁰
18.1	45.095 ¹³⁰	64.14 ¹⁰²	16.985 ¹⁶⁴	35.40 ¹²⁹	49.097 ²⁵⁴	47.62 ¹⁴⁴	9.150 ¹²¹	38.97 ⁶⁸
28.1	44.977 ¹¹⁸	63.06 ¹⁰⁸	16.840 ¹⁴⁵	33.94 ¹⁴⁶	48.868 ²²⁹	45.74 ¹⁸⁸	9.041 ¹⁰⁹	38.32 ⁶⁵
	98	111	122	150	198	228	93	59
Sept. 7.1	44.879 ⁷⁰	61.95 ¹⁰⁷	16.718 ⁹⁰	32.35 ¹⁶⁶	48.670 ¹⁵⁵	43.46 ²⁶⁴	8.948 ⁶⁸	37.73 ⁴⁶
17.1	44.809 ³⁶	60.88 ¹⁰⁰	16.628 ⁴⁹	30.69 ¹⁶⁵	48.515 ¹⁰⁷	40.82 ²⁹⁶	8.880 ⁴⁰	37.27 ³⁴
27.0	44.773 ⁵	59.88 ⁸³	16.579 ²	29.04 ¹⁵⁶	48.408 ⁵¹	37.86 ³²²	8.840 ¹	36.93 ¹³
Oct. 7.0	44.778 ⁵³	59.05 ⁶⁴	16.577 ⁵¹	27.48 ¹¹¹	48.357 ¹⁰	34.64 ³⁴²	8.839 ⁴⁴	36.80 ³¹
17.0	44.831 ¹⁰⁰	58.41 ⁴⁰	16.628 ¹⁰⁸	26.07 ¹¹⁸	48.367 ⁸⁰	31.22 ³⁵⁴	8.883 ⁸⁹	36.90 ¹⁰
27.0	44.931	58.01	16.736	24.89	48.447	27.68	8.972	37.21
Nov. 5.9	45.082 ¹⁵¹	57.93 ⁸	16.901 ¹⁶⁵	24.01 ⁸⁸	48.597 ¹⁵⁰	24.07 ³⁶¹	9.106 ¹³⁴	37.84 ⁶³
15.9	45.282 ²⁰⁰	58.17 ²⁴	17.122 ²²¹	23.49 ⁵²	48.818 ²²¹	20.51 ³⁵⁶	9.289 ¹⁸³	38.71 ⁸⁷
25.9	45.527 ²⁴⁵	58.74 ⁵⁷	17.393 ²⁷¹	23.38 ¹¹	49.105 ²⁸⁷	17.07 ³⁴⁴	9.518 ²²⁹	39.90 ¹¹⁹
Dec. 5.8	45.811 ²⁸⁴	59.67 ⁹³	17.707 ³¹⁴	23.68 ³⁰	49.457 ³⁵²	13.85 ³²²	9.779 ²⁶¹	41.32 ¹⁴²
	315	125	348	70	404	289	295	166
15.8	46.126	60.92	18.055	24.38	49.861	10.96	10.074	42.98
25.8	46.462 ³³⁶	62.46 ¹⁵⁴	18.426 ³⁷¹	25.52 ¹¹⁴	50.306 ⁴⁴⁵	8.48 ²⁴⁸	10.389 ³¹⁵	44.82 ¹⁸⁴
35.8	46.806 ³¹⁴	64.23 ¹⁷⁷	18.806 ³⁸⁰	27.01 ¹⁴⁹	50.781 ⁴⁷⁵	6.50 ¹⁹⁸	10.716 ³²⁷	46.75 ¹⁹³
Mean Place	43.877	56.48	15.645	23.68	49.777	37.61	8.036	35.23
Sec δ , Tan δ	1.084	-0.420	1.241	-0.735	1.758	+1.446	1.018	-0.190
D ψ α , D ω α	+0.065	-0.026	+0.068	-0.046	+0.048	+0.090	+0.063	-0.012
D ψ δ , D ω δ	-0.38	-0.32	-0.38	-0.33	-0.37	-0.35	-0.37	-0.35

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2001. Mag. 6.1		70 Virginis. Mag. 5.2		ζ Virginis. Mag. 3.4		17 H. Canum Venat. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 24	° ' " +72 46	h m 13 24	° ' " +14 11	h m 13 30	° ' " - 0 12	h m 13 31	° ' " +37 34
	s	"	s	"	s	"	s	"
Jan. 0.8	7.12	71.99	39.312	20.28	45.670	6.62	20.725	26.69
10.8	7.94	70.68	39.639	18.20	45.990	8.66	21.098	24.72
20.7	8.78	70.02	39.961	16.39	46.308	10.59	21.470	23.21
30.7	9.60	70.03	40.271	14.88	46.612	12.32	21.829	22.25
Feb. 9.7	10.37	70.70	40.557	13.75	46.895	13.88	22.167	21.82
	70	130	258	75	255	126	308	12
19.6	11.07	72.00	40.815	13.00	47.150	15.14	22.475	21.94
Mar. 1.6	11.68	73.87	41.039	12.63	47.371	16.17	22.743	22.59
11.6	12.18	76.22	41.227	12.66	47.563	16.88	22.967	23.72
21.6	12.55	78.95	41.377	13.01	47.717	17.27	23.146	25.23
31.5	12.78	81.93	41.487	13.68	47.836	17.44	23.276	27.11
	11	314	77	90	84	7	88	211
Apr. 10.5	12.89	85.07	41.564	14.58	47.920	17.37	23.364	29.22
20.5	12.86	88.21	41.607	15.68	47.973	17.10	23.405	31.49
30.5	12.71	91.26	41.621	16.90	47.999	16.64	23.406	33.82
May 10.4	12.44	94.10	41.605	18.20	47.997	16.07	23.369	36.10
20.4	12.08	96.65	41.568	19.50	47.974	15.39	23.300	38.28
	16	217	61	126	47	72	98	199
30.4	11.62	98.82	41.507	20.76	47.927	14.67	23.202	40.27
June 9.3	11.11	100.56	41.428	21.94	47.862	13.93	23.083	42.00
19.3	10.54	101.80	41.333	23.01	47.779	13.17	22.939	43.49
29.3	9.93	102.52	41.225	23.93	47.682	12.42	22.782	44.61
July 9.3	9.29	102.71	41.105	24.68	47.571	11.70	22.609	45.36
	63	35	127	56	119	65	177	39
19.2	8.66	102.36	40.978	25.24	47.452	11.05	22.432	45.75
29.2	8.04	101.48	40.847	25.61	47.327	10.47	22.250	45.73
Aug. 8.2	7.44	100.07	40.718	25.75	47.201	9.97	22.070	45.31
18.2	6.88	98.20	40.592	25.65	47.078	9.58	21.900	44.51
28.1	6.37	95.86	40.479	25.33	46.964	9.32	21.740	43.34
	44	274	100	57	96	10	136	155
Sept. 7.1	5.93	93.12	40.379	24.76	46.868	9.22	21.604	41.79
17.1	5.57	90.05	40.306	23.95	46.794	9.30	21.494	39.90
27.0	5.31	86.67	40.262	22.87	46.746	9.54	21.417	37.66
Oct. 7.0	5.15	83.06	40.253	21.53	46.736	10.04	21.385	35.15
17.0	5.10	79.31	40.285	19.93	46.765	10.74	21.396	32.40
	8	382	77	183	75	96	65	297
27.0	5.18	75.49	40.362	18.10	46.840	11.70	21.461	29.43
Nov. 5.9	5.38	71.66	40.485	16.05	46.963	12.94	21.580	26.31
15.9	5.70	67.96	40.656	13.82	47.131	14.41	21.752	23.13
25.9	6.16	64.48	40.870	11.46	47.343	16.10	21.980	19.97
Dec. 5.9	6.72	61.29	41.124	9.03	47.591	17.96	22.253	16.90
	67	279	288	244	283	199	316	288
15.8	7.39	58.50	41.412	6.59	47.874	19.95	22.569	14.02
25.8	8.14	56.21	41.723	4.22	48.181	22.00	22.915	11.41
35.8	8.95	54.49	42.047	2.00	48.496	24.08	23.283	9.15
	75	229	311	237	307	205	346	261
	81	172	324	222	315	208	368	226
Mean Place	10.063	87.52	39.831	22.54	46.064	9.52	21.660	35.65
Sec δ, Tan δ	3.380	+3.228	1.031	+0.253	1.000	-0.004	1.262	+0.769
D _α , D _ω	+0.030	+0.201	+0.059	+0.016	+0.061	0.000	+0.053	+0.047
D _δ , D _ω	-0.37	-0.36	-0.37	-0.36	-0.37	-0.39	-0.37	-0.39

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Centauri. Mag. 2.6		m Virginis. Mag. 5.2		τ Boötis. Mag. 4.5		η Ursæ Majoris. (Alkaid.) Mag. 1.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 34 s	° ' -53 4	h m 13 37 s	° ' - 8 18	h m 13 43 s	° ' +17 50	h m 13 44 s	° ' +49 41
Jan. 0.8	59.958	12.91	33.721	47.98	35.503	21.11	29.184	38.36
10.8	60.440 ⁴⁸²	14.05 ¹¹⁴	34.045 ³²⁴	49.92 ¹⁹⁴	35.829 ³²⁶	18.97 ²¹⁴	29.610 ⁴²⁶	36.39 ¹⁹⁷
20.7	60.916 ⁴⁷⁶	15.62 ¹⁵⁷	34.365 ³²⁰	51.86 ¹⁹⁴	36.156 ³²⁷	17.16 ¹⁸¹	30.040 ⁴³⁰	35.00 ¹³⁹
30.7	61.371 ⁴⁵⁵	17.57 ¹⁹⁵	34.675 ³¹⁰	53.71 ¹⁸⁵	36.473 ³¹⁷	15.66 ¹⁵⁰	30.463 ⁴²³	34.19 ⁸¹
Feb. 9.7	61.798 ⁴²⁷	19.85 ²²⁸	34.963 ²⁸⁸	55.44 ¹⁷³	36.770 ²⁹⁷	14.59 ¹⁰⁷	30.866 ⁴⁰³	34.00 ¹⁹
	386	251	261	153	271	67	370	42
19.7	62.184	22.36	35.224	56.97	37.041	13.92	31.236	34.42
Mar. 1.6	62.524 ³⁴⁰	25.07 ²⁷¹	35.454 ²³⁰	58.31 ¹³⁴	37.282 ²⁴¹	13.68 ²⁴	31.564 ³²⁸	35.44 ¹⁰²
11.6	62.813 ²⁸⁹	27.90 ²⁸³	35.654 ²⁰⁰	59.40 ¹⁰⁹	37.487 ²⁰⁵	13.84 ¹⁶	31.842 ²⁷⁸	36.93 ¹⁴⁹
21.6	63.050 ²³⁷	30.76 ²⁸⁶	35.812 ¹⁵⁸	60.25 ⁸⁵	37.655 ¹⁶⁸	14.40 ⁵⁶	32.066 ²²⁴	38.90 ¹⁹⁷
31.5	63.237 ¹⁸⁷	33.63 ²⁸⁷	35.941 ¹²⁹	60.89 ⁶⁴	37.787 ¹³²	15.26 ⁸⁶	32.231 ¹⁶⁵	41.23 ²³³
	134	280	95	40	95	114	106	256
Apr. 10.5	63.371 ⁸³	36.43 ²⁶⁸	36.036 ⁶⁴	61.29 ²⁰	37.882 ⁶¹	16.40 ¹³³	32.337 ⁵³	43.79 ²⁷⁰
20.5	63.454 ³⁵	39.11 ²⁵²	36.100 ³⁴	61.49 ²	37.943 ²⁸	17.73 ¹⁴⁷	32.390 ¹	46.49 ²⁷⁶
30.5	63.489 ¹⁴	41.63 ²³¹	36.134 ¹⁰	61.51 ¹²	37.971 ⁰	19.20 ¹⁵²	32.391 ⁵⁰	49.25 ²⁷⁰
May 10.4	63.475 ⁵⁶	43.94 ²⁰⁵	36.144 ¹⁸	61.39 ²⁷	37.971 ²⁵	20.72 ¹⁵⁵	32.341 ⁹³	51.95 ²⁵⁴
20.4	63.419 ⁹⁹	45.99 ¹⁷⁵	36.126 ³⁷	61.12 ³⁶	37.946 ⁵²	22.27 ¹⁴⁹	32.248 ¹³³	54.49 ²²⁹
30.4	63.320	47.74 ¹⁴³	36.089 ⁶¹	60.76 ⁴⁶	37.894 ⁷³	23.76 ¹³⁷	32.115 ¹⁶⁶	56.78 ¹⁹⁸
June 9.4	63.181 ¹⁷³	49.17 ¹⁰⁶	36.028 ⁷⁹	60.30 ⁵¹	37.821 ⁹¹	25.13 ¹²⁵	31.949 ¹⁹²	58.76 ¹⁶⁶
19.3	63.008 ²⁰⁵	50.23 ⁷¹	35.949 ⁹²	59.79 ⁵⁹	37.730 ¹⁰⁹	26.38 ¹⁰⁶	31.757 ²¹⁷	60.42 ¹²⁰
29.3	62.803 ²²⁹	50.94 ²⁸	35.857 ¹¹⁰	59.20 ⁵⁹	37.621 ¹²²	27.44 ⁸⁷	31.540 ²³¹	61.62 ⁸²
July 9.3	62.574 ²⁴⁹	51.22 ¹³	35.747 ¹²⁰	58.61 ⁶⁴	37.499 ¹³⁴	28.31 ⁶³	31.309 ²¹⁵	62.44 ³²
19.2	62.325 ²⁶⁰	51.09 ⁵⁴	35.627 ¹³⁰	57.97 ⁶³	37.365 ¹³⁹	28.94 ⁴⁰	31.064 ²⁴⁹	62.76 ¹⁴
29.2	62.065 ²⁶³	50.55 ⁹²	35.497 ¹³⁰	57.34 ⁶³	37.226 ¹⁴³	29.34 ¹⁵	30.815 ²¹⁷	62.62 ⁵⁸
Aug. 8.2	61.802 ²⁵²	49.63 ¹³⁰	35.367 ¹²⁶	56.71 ⁵⁹	37.083 ¹³⁸	29.49 ¹²	30.568 ²³⁸	62.04 ¹⁰⁴
18.2	61.550 ²³⁴	48.33 ¹⁶²	35.241 ¹¹⁸	56.12 ⁵⁵	36.945 ¹³¹	29.37 ³⁹	30.330 ²²²	61.00 ¹⁴⁹
28.1	61.316 ²⁰²	46.71 ¹⁹²	35.123 ¹⁰⁶	55.57 ⁴⁵	36.814 ¹¹⁶	28.98 ⁶⁶	30.108 ¹⁹⁵	59.51 ¹⁹⁰
Sept. 7.1	61.114 ¹⁶⁰	44.79 ²¹⁰	35.017 ⁸⁰	55.12 ³⁴	36.698 ⁹⁴	28.32 ⁹³	29.913 ¹⁶⁴	57.61 ²³¹
17.1	60.954 ¹⁰⁸	42.69 ²²⁴	34.937 ⁵²	54.78 ¹⁸	36.604 ⁶⁶	27.39 ¹²³	29.749 ¹²⁵	55.30 ²⁶⁵
27.1	60.846 ⁴³	40.45 ²²⁸	34.885 ¹⁷	54.60 ¹	36.538 ³²	26.16 ¹⁴⁸	29.624 ⁷⁶	52.65 ²⁹³
Oct. 7.0	60.803 ²⁷	38.17 ²²²	34.868 ²⁶	54.61 ²⁰	36.506 ¹⁰	24.68 ¹⁷⁶	29.548 ²⁴	49.72 ³²⁰
17.0	60.830 ¹⁰⁰	35.95 ²⁰⁷	34.894 ⁷⁰	54.81 ⁴⁸	36.516 ⁵⁶	22.92 ²⁰⁰	29.524 ⁴⁰	46.52 ³³⁹
27.0	60.930	33.88 ¹⁸¹	34.964 ¹¹⁹	55.29 ⁷²	36.572 ¹⁰²	20.92 ²²¹	29.564 ¹⁰²	43.13 ³⁵⁰
Nov. 5.9	61.108 ²⁵²	32.07 ¹⁴⁹	35.083 ¹⁶⁶	56.01 ⁹⁸	36.674 ¹⁵¹	18.71 ²³⁹	29.666 ¹⁸⁷	39.63 ³⁵⁴
15.9	61.360 ³²²	30.58 ¹¹¹	35.249 ²¹²	56.99 ¹²⁷	36.825 ¹⁹⁸	16.32 ²⁵¹	29.833 ²³³	36.09 ³⁴⁹
25.9	61.682 ³⁸⁰	29.47 ⁶⁴	35.461 ²⁴⁹	58.26 ¹⁴⁹	37.023 ²⁴⁰	13.81 ²⁵⁷	30.066 ²⁹¹	32.60 ³³¹
Dec. 5.9	62.062 ⁴²⁶	28.86 ¹⁴	35.710 ²⁸⁵	59.75 ¹⁷⁰	37.263 ²⁷⁷	11.24 ²⁵⁵	30.357 ³⁴⁴	29.29 ³⁰⁷
15.8	62.488	28.72 ³⁶	35.995 ³⁰⁹	61.45 ¹⁸⁵	37.540 ³⁰⁴	8.69 ²⁴⁶	30.701 ³⁸⁶	26.22 ²⁷²
25.8	62.949 ⁴⁶¹	29.08 ⁸⁶	36.304 ³²⁰	63.30 ¹⁹³	37.844 ³²¹	6.23 ²²⁹	31.087 ⁴¹⁴	23.50 ²³¹
35.8	63.425	29.94	36.624	65.23	38.165	3.94	31.501	21.19
Mean Place	59.828	32.27	34.075	53.93	36.176	23.73	30.546	49.43
Sec δ, Tan δ	1.665	-1.331	1.011	-0.146	1.051	+0.322	1.546	+1.179
Dψα, Dωα	+0.075	-0.081	+0.063	-0.009	+0.057	+0.019	+0.047	+0.071
Dψδ, Dωδ	-0.36	-0.40	-0.36	-0.41	-0.36	-0.44	-0.36	-0.44

APPARENT PLACES OF STARS, 1923.

425

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	89 Virginis. Mag. 5.1		ζ Centauri. Mag. 3.1		η Boötis. Mag. 2.8		11 Boötis. Mag. 6.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 45 s	° ' " -17 44 "	h m 13 50 s	° ' " -46 54 "	h m 13 51 s	° ' " +18 46 "	h m 13 57 s	° ' " +27 45 "
Jan. 0.8	40.697	54.71	43.484	18.15	0.380	56.74	40.157	23.32
10.8	41.031 334	56.49 178	43.918 434	19.26 111	0.707 327	54.58 216	40.495 338	21.12 220
20.7	41.363 332	58.36 187	44.351 433	20.73 117	1.034 327	52.72 186	40.836 341	19.30 182
30.7	41.684 321	60.27 191	44.771 420	22.56 183	1.354 320	51.20 152	41.172 336	17.92 138
Feb. 9.7	41.984 300	62.15 188	45.164 393	24.65 209	1.656 302	50.11 109	41.492 320	17.01 91
	274	178	361	231	277	68	295	41
19.7	42.258	63.93	45.525	26.96	1.933	49.43	41.787	16.60
Mar. 1.6	42.501 243	65.60 167	45.848 323	29.42 246	2.181 248	49.18 25	42.052 265	16.70 10
11.6	42.711 210	67.12 152	46.130 282	31.97 255	2.394 213	49.37 19	42.279 227	17.27 57
21.6	42.886 175	68.45 133	46.365 235	34.54 257	2.570 176	49.94 57	42.470 191	18.26 99
31.6	43.027 141	69.57 112	46.556 191	37.09 255	2.712 142	50.82 88	42.619 149	19.62 136
	106	95	148	247	101	118	113	164
Apr. 10.5	43.133 76	70.52 78	46.704 101	39.56 237	2.813 71	52.00 139	42.732 74	21.26 186
20.5	43.209 47	71.30 58	46.805 60	41.93 222	2.884 37	53.39 150	42.806 39	23.12 197
30.5	43.256 18	71.88 41	46.865 19	44.15 204	2.921 6	54.89 159	42.845 5	25.09 198
May 10.4	43.274 9	72.29 26	46.884 22	46.19 181	2.927 43	56.48 159	42.850 26	27.07 203
20.4	43.265 32	72.55 9	46.862 59	48.00 155	2.905 22	58.07 156	42.824 54	29.10 189
30.4	43.233 56	72.64 5	46.803 95	49.55 127	2.862 69	59.63 142	42.770 79	30.99 173
June 9.4	43.177 78	72.59 19	46.708 129	50.82 96	2.793 90	61.05 129	42.691 101	32.72 153
19.3	43.099 95	72.40 29	46.579 158	51.78 62	2.703 96	62.34 110	42.590 121	34.25 127
29.3	43.004 113	72.11 44	46.421 185	52.40 28	2.597 123	63.44 91	42.469 139	35.52 98
July 9.3	42.891 126	71.67 54	46.236 205	52.68 9	2.474 133	64.35 68	42.330 150	36.50 68
19.3	42.765 136	71.13 64	46.031 218	52.59 43	2.341 141	65.03 41	42.180 159	37.18 36
29.2	42.629 140	70.49 72	45.813 225	52.16 78	2.200 146	65.44 14	42.021 163	37.54 1
Aug. 8.2	42.489 139	69.77 78	45.588 223	51.38 113	2.054 142	65.58 12	41.858 161	37.55 33
18.2	42.350 130	68.99 81	45.365 209	50.25 139	1.912 138	65.46 39	41.697 154	37.22 67
28.1	42.220 116	68.18 80	45.156 185	48.86 165	1.774 120	65.07 71	41.543 141	36.55 100
Sept. 7.1	42.104 93	67.38 76	44.971 152	47.21 184	1.654 100	64.36 94	41.402 117	35.55 134
17.1	42.011 62	66.62 67	44.819 109	45.37 195	1.554 75	63.42 128	41.285 91	34.21 166
27.1	41.949 25	65.95 54	44.710 55	43.42 199	1.479 38	62.14 155	41.194 54	32.55 197
Oct. 7.0	41.924 16	65.41 36	44.655 7	41.43 193	1.441 1	60.59 179	41.140 12	30.58 225
17.0	41.940 66	65.05 12	44.662 73	39.50 179	1.442 49	58.80 204	41.128 36	28.33 249
27.0	42.006 116	64.93 13	44.735 142	37.71 159	1.491 96	56.76 228	41.164 85	25.84 269
Nov. 6.0	42.122 167	65.06 43	44.877 210	36.12 126	1.587 144	54.48 243	41.249 138	23.15 283
15.9	42.289 212	65.49 70	45.087 272	34.86 89	1.731 194	52.05 257	41.387 188	20.32 293
25.9	42.501 255	66.19 102	45.359 329	33.97 48	1.925 233	49.48 262	41.575 235	17.39 292
Dec. 5.9	42.756 290	67.21 129	45.688 374	33.49 3	2.158 272	46.86 261	41.810 275	14.47 283
15.8	43.046 315	68.50 151	46.062 409	33.46 41	2.430 302	44.25 251	42.085 307	11.64 269
25.8	43.361 331	70.01 171	46.471 427	33.87 85	2.732 320	41.74 233	42.392 331	8.95 242
35.8	43.692	71.72	46.898	34.72	3.052	39.41	42.723	6.53
Mean Place	41.016	64.11	43.591	36.33	1.108	59.32	41.057	28.26
Sec δ, Tan δ	1.050	-0.320	1.464	-1.069	1.056	+0.340	1.130	+0.526
Dψα, Dωα	+0.065	-0.019	+0.074	-0.063	+0.057	+0.020	+0.054	+0.031
Dψδ, Dωδ	-0.36	-0.44	-0.35	-0.46	-0.35	-0.47	-0.35	-0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Virginis. Mag. 4.3		θ Apodis. Var. 5.5-6.6		β Centauri. Mag. 0.9		π Hydræ. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 13 57 s 13 57	° ' + 1 54 " s 13 57	h m 13 57 s 13 57	° ' -76 25 " s 13 57	h m 13 58 s 13 58	° ' -59 59 " s 13 58	h m 14 1 s 14 1	° ' -26 18 " s 14 1
Jan. 0.8	43.012	62.78	46.44	10.25	22.42	47.20	58.550	31.18
10.8	43.328	60.73	47.52	10.45	22.98	47.87	58.898	32.68
20.7	43.646	58.82	48.62	11.25	23.54	49.03	59.248	34.38
30.7	43.957	57.09	49.69	12.59	24.09	50.60	59.588	36.20
Feb. 9.7	44.250	55.59	50.71	14.42	24.61	52.57	59.911	38.09
19.7	44.519	54.38	51.66	16.71	25.09	54.88	60.207	40.00
Mar. 1.6	44.761	53.46	52.52	19.37	25.52	57.44	60.475	41.87
11.6	44.972	52.86	53.27	22.34	25.90	60.22	60.710	43.66
21.6	45.151	52.54	53.90	25.53	26.23	63.13	60.910	45.33
31.6	45.295	52.53	54.40	28.88	26.49	66.11	61.076	46.88
Apr. 10.5	45.406	52.76	54.78	32.30	26.69	69.08	61.208	48.29
20.5	45.486	53.21	55.02	35.74	26.83	72.00	61.307	49.52
30.5	45.537	53.82	55.13	39.11	26.91	74.81	61.373	50.60
May 10.4	45.561	54.55	55.10	42.36	26.93	77.46	61.409	51.51
20.4	45.560	55.38	54.94	45.42	26.90	79.89	61.417	52.23
30.4	45.533	56.25	54.65	48.21	26.80	82.06	61.396	52.79
June 9.4	45.485	57.12	54.24	50.64	26.66	83.94	61.348	53.17
19.3	45.416	57.99	53.72	52.70	26.46	85.43	61.274	53.36
29.3	45.327	58.80	53.10	54.32	26.22	86.55	61.178	53.38
July 9.3	45.223	59.56	52.41	55.47	25.94	87.26	61.060	53.20
19.3	45.104	60.23	51.65	56.09	25.63	87.54	60.925	52.85
29.2	44.977	60.81	50.86	56.19	25.31	87.36	60.777	52.32
Aug. 8.2	44.843	61.27	50.06	55.75	24.97	86.70	60.622	51.62
18.2	44.710	61.61	49.28	54.77	24.64	85.64	60.464	50.79
28.1	44.581	61.80	48.54	53.31	24.33	84.21	60.313	49.84
Sept. 7.1	44.465	61.82	47.88	51.39	24.04	82.39	60.175	48.82
17.1	44.368	61.67	47.32	49.07	23.81	80.30	60.061	47.75
27.1	44.297	61.29	46.90	46.44	23.64	77.99	59.977	46.70
Oct. 7.0	44.260	60.70	46.64	43.60	23.53	75.54	59.931	45.71
17.0	44.263	59.89	46.54	40.64	23.51	73.08	59.932	44.87
27.0	44.311	58.82	46.63	37.70	23.58	70.69	59.984	44.21
Nov. 6.0	44.405	57.50	46.91	34.89	23.74	68.49	60.089	43.78
15.9	44.547	55.97	47.37	32.31	23.99	66.55	60.248	43.64
25.9	44.736	54.21	48.00	30.09	24.33	64.94	60.459	43.81
Dec. 5.9	44.967	52.30	48.78	28.31	24.74	63.78	60.716	44.30
15.8	45.232	50.26	49.68	27.04	25.21	63.13	61.011	45.12
25.8	45.526	48.15	50.68	26.33	25.73	62.96	61.335	46.24
35.8	45.837	46.05	51.74	26.21	26.28	63.34	61.678	47.62
Mean Place	43.578	59.59	46.229	33.80	22.493	68.35	58.907	43.73
Sec δ , Tan δ	1.001	+0.033	4.261	-4.142	2.000	-1.732	1.116	-0.495
$D\psi\alpha$, $D\omega\alpha$	+0.061	+0.002	+0.115	-0.240	+0.084	-0.100	+0.068	-0.028
$D\psi\delta$, $D\omega\delta$	-0.35	-0.49	-0.35	-0.49	-0.35	-0.49	-0.34	-0.51

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Centauri. Mag. 2.3		α Draconis. Mag. 3.6		δ Boötis. Mag. 4.8		κ Virginis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 2	° ' -35 59	h m 14 2	° ' +64 44	h m 14 6	° ' +25 27	h m 14 8	° ' - 9 54
	s	"	s	"	s	"	s	"
Jan. 0.8	8.352	15.20	15.91	24.10	52.375	16.65	46.616	50.15
10.8	8.729 ³⁷⁷	16.47 ¹²⁷	16.48 ⁵⁷	22.16 ¹⁹⁴	52.704 ³²⁹	14.42 ²²³	46.935 ³¹⁹	51.95 ¹⁸⁰
20.8	9.108 ³⁷⁹	18.03 ¹⁵⁶	17.08 ⁶⁰	20.84 ¹³²	53.041 ³³⁷	12.54 ¹⁸⁸	47.257 ³²²	53.78 ¹⁸³
30.7	9.476 ³⁶⁸	19.82 ¹⁷⁹	17.68 ⁶⁰	20.15 ⁶⁹	53.371 ³³⁰	11.03 ¹⁵¹	47.576 ³¹⁹	55.56 ¹⁷⁸
Feb. 9.7	9.824 ³¹⁸	21.78 ¹⁹⁶	18.26 ⁵⁸	20.14 ¹	53.690 ³¹⁹	10.02 ¹⁰¹	47.877 ³⁰¹	57.23 ¹⁶⁷
	322	208	54	61	294	51	277	152
19.7	10.146	23.86	18.80	20.78	53.984	9.51	48.154	58.75
Mar. 1.6	10.435 ²⁸⁹	26.00 ²¹¹	19.29 ⁴⁹	22.06 ¹²⁸	54.252 ²⁶⁸	9.46 ⁵	48.409 ²⁵⁵	60.07 ¹³²
11.6	10.691 ²⁵⁶	28.15 ²¹⁵	19.72 ⁴³	23.88 ¹⁸²	54.483 ²³¹	9.90 ⁴¹	48.632 ²²³	61.17 ¹¹⁰
21.6	10.908 ²¹⁷	30.25 ²¹⁰	20.06 ³¹	26.18 ²³⁰	54.680 ¹⁹⁷	10.74 ⁸⁴	48.823 ¹⁹¹	62.06 ⁸⁹
31.6	11.088 ¹⁸⁰	32.30 ²⁰⁵	20.32 ²⁶	28.85 ²⁶⁷	54.839 ¹⁵⁹	11.95 ¹²¹	48.981 ¹⁵⁸	62.70 ⁶⁴
	143	192	17	294	121	152	127	43
Apr. 10.5	11.231	34.22	20.49	31.79	54.960	13.47	49.108	63.13
20.5	11.337 ¹⁰⁶	36.00 ¹⁷⁸	20.57 ⁸	34.87 ³⁰⁸	55.045 ⁸⁵	15.21 ¹⁷⁴	49.205 ⁹⁷	63.38 ²⁵
30.5	11.407 ⁷⁰	37.65 ¹⁶⁵	20.57 ⁰	37.96 ³⁰⁹	55.094 ⁴⁹	17.11 ¹⁹⁰	49.275 ⁷⁰	63.48 ¹⁰
May 10.5	11.442 ³⁵	39.12 ¹⁴⁷	20.48 ⁹	40.98 ³⁰²	55.110 ¹⁶	19.05 ¹⁹⁴	49.311 ³⁶	63.40 ⁸
20.4	11.444 ²	40.39 ¹²⁷	20.32 ¹⁶	43.79 ²⁸¹	55.096 ¹⁴	20.99 ¹⁹⁴	49.325 ¹¹	63.19 ²¹
	27	106	22	255	44	185	15	30
30.4	11.417	41.45	20.10	46.34	55.052	22.84	49.310	62.89
June 9.4	11.356 ⁶¹	42.30 ⁸⁵	19.81 ²⁹	48.57 ²²³	54.985 ⁶⁷	24.56 ¹⁷²	49.274 ³⁶	62.49 ⁴⁰
19.3	11.267 ⁸⁹	42.90 ⁶⁰	19.48 ³³	50.36 ¹⁷⁹	54.893 ⁹²	26.09 ¹⁵³	49.212 ⁶²	62.04 ⁴⁵
29.3	11.151 ¹¹⁶	43.25 ³⁵	19.10 ³⁸	51.67 ¹³¹	54.779 ¹¹⁴	27.38 ¹²⁹	49.128 ⁸⁴	61.54 ⁵⁰
July 9.3	11.011 ¹¹⁰	43.33 ⁸	18.70 ⁴⁰	52.52 ⁸⁵	54.649 ¹³⁰	28.43 ¹⁰⁵	49.031 ⁹⁷	60.99 ⁵⁵
	158	18	42	30	146	76	117	58
19.3	10.853	43.15	18.28	52.82	54.503	29.19	48.914	60.41
29.2	10.680 ¹⁷³	42.71 ⁴⁴	17.84 ⁴⁴	52.63 ¹⁹	54.350 ¹⁵³	29.64 ⁴⁵	48.780 ¹³⁴	59.81 ⁶⁰
Aug. 8.2	10.499 ¹⁸¹	42.01 ⁷⁰	17.41 ⁴³	51.89 ⁷⁴	54.188 ¹⁶²	29.74 ¹⁰	48.643 ¹³⁷	59.23 ⁵⁸
18.2	10.316 ¹⁸³	41.10 ⁹¹	17.00 ¹¹	50.64 ¹²⁵	54.028 ¹⁶⁰	29.53 ²¹	48.503 ¹⁴⁰	58.66 ⁵⁷
28.2	10.141 ¹⁷⁵	39.97 ¹¹³	16.60 ⁴⁰	48.93 ¹⁷¹	53.870 ¹⁵⁸	28.98 ⁵⁵	48.366 ¹³⁷	58.13 ⁵³
	160	130	36	218	142	84	124	46
Sept. 7.1	9.981	38.67	16.24	46.75	53.728	28.14	48.242	57.67
17.1	9.849 ¹³²	37.27 ¹⁴⁰	15.93 ³¹	44.17 ²⁵⁸	53.607 ¹²¹	26.92 ¹²²	48.134 ¹⁰⁸	57.29 ³⁸
27.1	9.751 ⁹⁸	35.81 ¹⁴⁶	15.68 ²⁵	41.20 ²⁹⁷	53.511 ⁹⁶	25.42 ¹⁵⁰	48.057 ⁷⁷	57.05 ²⁴
Oct. 7.0	9.696 ⁵⁵	34.36 ¹⁴⁵	15.49 ¹⁹	37.92 ³²⁸	53.450 ⁶¹	23.58 ¹⁸⁴	48.009 ⁴⁸	56.98 ⁷
17.0	9.693 ³	32.99 ¹³⁷	15.38 ¹¹	34.40 ³⁵²	53.429 ²¹	21.47 ²¹¹	48.005 ⁴	57.07 ⁹
	53	121	3	369	26	235	40	32
27.0	9.746	31.78	15.35	30.71	53.455	19.12	48.045	57.39
Nov. 6.0	9.858 ¹¹²	30.79 ⁹⁹	15.42 ⁷	26.91 ³⁸⁰	53.532 ⁷⁷	16.54 ²⁵⁸	48.133 ⁸⁸	57.98 ⁵³
15.9	10.029 ¹⁷¹	30.09 ⁷⁰	15.58 ¹⁶	23.11 ³⁸⁰	53.659 ¹²⁷	13.78 ²⁷⁶	48.271 ¹³⁸	58.78 ⁸⁰
25.9	10.256 ²²⁷	29.72 ³⁷	15.84 ²⁶	19.41 ³⁷⁰	53.837 ¹⁷⁸	10.94 ²⁸⁴	48.456 ¹⁸⁵	59.86 ¹⁰⁸
Dec. 5.9	10.534 ²⁷⁸	29.72 ⁰	16.19 ³⁵	15.92 ³⁴⁹	54.061 ²²¹	8.08 ²⁸⁶	48.686 ²³⁰	61.17 ¹³¹
	319	36	43	323	265	283	267	152
15.9	10.853	30.08	16.62	12.69	54.326	5.25	48.953	62.69
25.8	11.204 ³⁵¹	30.82 ⁷⁴	17.12 ⁵⁰	9.89 ²⁸⁰	54.626 ³⁰⁰	2.57 ²⁶⁸	49.248 ²⁹⁵	64.37 ¹⁶³
35.8	11.574 ³⁷⁰	31.93 ¹¹¹	17.67 ⁵⁵	7.57 ²³²	54.946 ³²⁰	0.13 ²⁴⁴	49.562 ³¹⁴	66.19 ¹⁸²
Mean Place	8.646	30.63	18.301	36.51	53.285	20.49	47.140	57.61
Sec δ , Tan δ	1.236	-0.726	2.344	+2.120	1.108	+0.476	1.015	-0.175
$D\psi\alpha$, $D\omega\alpha$	+0.071	-0.042	+0.033	+0.122	+0.055	+0.027	+0.064	-0.010
$D\psi\delta$, $D\omega\delta$	-0.34	-0.51	-0.34	-0.51	-0.34	-0.53	-0.34	-0.53

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	4 Ursæ Minoris. Mag. 5.0		ι Virginis. Mag. 4.2		α Boëtis. (Arcturus.) Mag. 0.2		λ Boëtis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 8	° ' +77 54	h m 14 11	° ' - 5 37	h m 14 12	° ' +19 34	h m 14 13	° ' +46 26
	s 104	" 179	s 313	" 191	s 315	" 228	s 391	" 224
Jan. 0.8	62.30	20.33	57.873	55.13	8.069	55.64	26.064	20.00
10.8	63.34	18.54	58.186	57.04	8.384	53.36	26.455	17.76
20.8	64.45	17.38	58.508	58.92	8.708	51.37	26.860	15.98
30.7	65.58	16.89	58.822	60.69	9.028	49.74	27.263	14.82
Feb. 9.7	66.69	17.08	59.121	62.31	9.334	48.51	27.655	14.23
19.7	67.74	17.94	59.398	63.74	9.620	47.74	28.022	14.28
Mar. 1.6	68.69	19.41	59.651	64.92	9.881	47.42	28.356	14.92
11.6	69.52	21.44	59.873	65.86	10.106	47.50	28.649	16.13
21.6	70.19	23.92	60.065	66.53	10.300	48.02	28.894	17.83
31.6	70.69	26.75	60.224	66.97	10.459	48.88	29.091	19.89
Apr. 10.5	71.01	29.83	60.352	67.17	10.581	50.04	29.234	22.31
20.5	71.14	33.02	60.449	67.17	10.671	51.43	29.328	24.92
30.5	71.09	36.21	60.518	67.00	10.726	52.98	29.371	27.63
May 10.5	70.86	39.27	60.558	66.68	10.750	54.62	29.366	30.36
20.4	70.46	42.13	60.573	66.26	10.745	56.29	29.317	33.00
30.4	69.92	44.67	60.562	65.75	10.712	57.90	29.230	35.47
June 9.4	69.25	46.84	60.526	65.18	10.656	59.42	29.104	37.67
19.3	68.48	48.56	60.467	64.58	10.574	60.79	28.949	39.59
29.3	67.62	49.78	60.386	63.95	10.471	61.97	28.764	41.12
July 9.3	66.70	50.49	60.288	63.33	10.353	62.94	28.557	42.26
19.3	65.73	50.66	60.173	62.72	10.217	63.69	28.333	42.94
29.2	64.76	50.29	60.044	62.15	10.069	64.17	28.098	43.17
Aug. 8.2	63.79	49.37	59.908	61.61	9.916	64.35	27.856	42.97
18.2	62.85	47.96	59.769	61.14	9.761	64.24	27.618	42.29
28.2	61.96	46.04	59.633	60.74	9.611	63.87	27.389	41.18
Sept. 7.1	61.14	43.67	59.509	60.43	9.471	63.19	27.176	39.63
17.1	60.43	40.90	59.401	60.26	9.349	62.23	26.990	37.69
27.1	59.82	37.79	59.319	60.24	9.253	60.94	26.836	35.33
Oct. 7.0	59.35	34.36	59.269	60.40	9.191	59.37	26.726	32.65
17.0	59.03	30.72	59.260	60.77	9.168	57.53	26.662	29.68
27.0	58.88	26.93	59.295	61.36	9.191	55.42	26.659	26.46
Nov. 6.0	58.90	23.08	59.379	62.19	9.260	53.10	26.716	23.05
15.9	59.10	19.25	59.510	63.30	9.381	50.57	26.838	19.57
25.9	59.49	15.56	59.690	64.63	9.550	47.92	27.021	16.06
Dec. 5.9	60.06	12.10	59.913	66.16	9.767	45.19	27.266	12.65
15.9	60.79	8.98	60.174	67.89	10.019	42.48	27.562	9.41
25.8	61.67	6.29	60.465	69.74	10.309	39.85	27.906	6.48
35.8	62.67	4.11	60.773	71.66	10.618	37.42	28.282	3.92
Mean Place	67.406	33.35	58.450	61.30	8.915	57.51	27.503	28.69
Sec δ, Tan δ	4.774	+4.668	1.005	-0.099	1.061	+0.356	1.451	+1.052
L _ψ α, D _ω α	-0.005	+0.263	+0.063	-0.006	+0.056	+0.020	+0.046	+0.059
L _ψ δ, L _ω δ	-0.34	-0.53	-0.33	-0.54	-0.33	-0.55	-0.33	-0.55

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Virginis. Mag. 4.6		2 Libræ. Mag. 6.3		θ Boëtis. Mag. 4.1		f Boëtis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 14	° ' -13 0	h m 14 19	° ' -11 21	h m 14 22	° ' +52 11	h m 14 22	° ' +19 34
	s	"	s	"	s	"	s	"
Jan. 0.8	55.824	54.00	16.250	38.84	32.865	72.78	51.542	19.18
10.8	56.147 ³²³	55.74 ¹⁷⁴	16.569 ³¹⁹	40.60 ¹⁷⁶	33.285 ⁴²⁰	70.46 ²³²	51.857 ³¹⁵	16.90 ²²⁸
20.8	56.471 ³²⁴	57.49 ¹⁷⁵	16.894 ³²⁵	42.38 ¹⁷⁸	33.721 ⁴³⁶	68.67 ¹⁷⁹	52.181 ³²⁴	14.92 ¹⁹⁸
30.7	56.792 ³²¹	59.27 ¹⁷⁸	17.213 ³¹⁹	44.13 ¹⁷⁵	34.164 ⁴⁴³	67.50 ¹¹⁷	52.503 ³²²	13.29 ¹⁶³
Feb. 9.7	57.098 ³⁰⁶	60.97 ¹⁷⁰	17.518 ³⁰⁵	45.79 ¹⁶⁶	34.595 ⁴³¹	66.92 ⁵⁸	52.815 ³¹²	12.08 ¹²¹
	286	155	284	152	409	10	291	78
19.7	57.384	62.52	17.802	47.31	35.004	67.02	53.106	11.30
Mar. 1.7	57.642 ²⁵⁸	63.94 ¹⁴²	18.062 ²⁶⁰	48.66 ¹³⁵	35.378 ³⁷⁴	67.72 ⁷⁰	53.373 ²⁶⁷	10.98 ³²
11.6	57.872 ²³⁰	65.15 ¹²¹	18.293 ²³¹	49.80 ¹¹⁴	35.709 ³³¹	69.02 ¹³⁰	53.610 ²³⁷	11.11 ¹³
21.6	58.069 ¹⁹⁷	66.17 ¹⁰²	18.494 ²⁰¹	50.74 ⁹⁴	35.989 ²⁸⁰	70.83 ¹⁸¹	53.814 ²⁰⁴	11.64 ⁵³
31.6	58.235 ¹⁶⁶	66.98 ⁸¹	18.663 ¹⁶⁹	51.44 ⁷⁰	36.214 ²²⁵	73.04 ²²¹	53.985 ¹⁷¹	12.55 ⁹¹
	136	61	137	51	166	256	135	121
Apr. 10.5	58.371	67.59	18.800	51.95	36.380	75.60	54.120	13.76
20.5	58.476 ¹⁰⁵	68.02 ⁴³	18.908 ¹⁰⁸	52.28 ³³	36.490 ¹¹⁰	78.36 ²⁷⁶	54.221 ¹⁰¹	15.20 ¹⁴⁴
30.5	58.549 ⁷³	68.28 ²⁶	18.986 ⁷⁸	52.43 ¹⁵	36.540 ⁵⁰	81.24 ²⁸⁸	54.289 ⁶⁸	16.83 ¹⁶³
May 10.5	58.595 ⁴⁶	68.40 ¹²	19.035 ⁴⁹	52.44 ¹	36.537 ³	84.12 ²⁸⁸	54.326 ³⁷	18.56 ¹⁷³
20.4	58.615 ²⁰	68.36 ⁴	19.058 ²³	52.31 ¹³	36.481 ⁵⁶	86.91 ²⁷⁹	54.333 ⁷	20.30 ¹⁷⁴
	7	14	4	23	102	259	22	171
30.4	58.608	68.22	19.054	52.08	36.379	89.50	54.311	22.01
June 9.4	58.574 ³⁴	67.97 ²⁵	19.025 ²⁹	51.77 ³¹	36.233 ¹⁴⁶	91.82 ²³²	54.265 ⁴⁶	23.63 ¹⁶²
19.4	58.515 ⁵⁹	67.65 ³²	18.971 ⁵¹	51.38 ³⁹	36.048 ¹⁸⁵	93.84 ²⁰²	54.193 ⁷²	25.11 ¹⁴⁸
29.3	58.437 ⁷⁸	67.27 ³⁸	18.894 ⁷⁷	50.94 ⁴¹	35.833 ²¹⁵	95.46 ¹⁶²	54.098 ⁹⁵	26.41 ¹³⁰
July 9.3	58.336 ¹⁰¹	66.79 ⁴⁸	18.797 ⁹⁷	50.44 ⁵⁰	35.589 ²⁴⁴	96.64 ¹¹⁸	53.983 ¹¹⁵	27.48 ¹⁰⁷
	118	52	116	53	264	74	132	85
19.3	58.218	66.27	18.681	49.91	35.325	97.38	53.851	28.33
29.2	58.086 ¹³²	65.70 ⁵⁷	18.551 ¹³⁰	49.35 ⁵⁶	35.047 ²⁷⁸	97.61 ²³	53.706 ¹⁴⁵	28.90 ⁵⁷
Aug. 8.2	57.946 ¹⁴⁰	65.11 ⁵⁹	18.412 ¹³⁹	48.78 ⁵⁷	34.762 ²⁸⁵	97.39 ²²	53.553 ¹⁵³	29.20 ³⁰
18.2	57.803 ¹⁴³	64.51 ⁶⁰	18.267 ¹⁴⁵	48.22 ⁵⁶	34.477 ²⁸⁵	96.65 ⁷⁴	53.396 ¹⁵⁷	29.22 ²
28.2	57.660 ¹⁴³	63.92 ⁵⁹	18.125 ¹⁴²	47.68 ⁵¹	34.201 ²⁷⁶	95.47 ¹¹⁸	53.240 ¹⁵⁶	28.94 ²⁸
	129	57	131	50	256	165	145	58
Sept. 7.1	57.531	63.35	17.994	47.18	33.945	93.82	53.095	28.36
17.1	57.419 ¹¹²	62.87 ⁴⁸	17.880 ¹¹⁴	46.77 ⁴¹	33.717 ²²⁸	91.75 ²⁰⁷	52.967 ¹²⁸	27.48 ⁸⁸
27.1	57.333 ⁸⁶	62.47 ⁴⁰	17.791 ⁸⁹	46.47 ³⁰	33.525 ¹⁹²	89.27 ²⁴⁸	52.864 ¹⁰³	26.30 ¹¹⁸
Oct. 7.1	57.282 ⁵¹	62.23 ²⁴	17.735 ⁵⁶	46.30 ¹⁷	33.380 ¹⁴⁵	86.41 ²⁸⁶	52.793 ⁷¹	24.82 ¹⁴⁸
17.0	57.269 ¹³	62.16 ⁷	17.719 ¹⁶	46.33 ³	33.288 ⁹²	83.31 ³¹⁰	52.760 ³³	23.05 ¹⁷⁷
	35	12	29	22	32	338	11	202
27.0	57.304	62.28	17.748	46.55	33.256	79.93	52.771	21.03
Nov. 6.0	57.387 ⁸³	62.65 ³⁷	17.827 ⁷⁹	47.02 ⁴⁷	33.291 ³⁵	76.37 ³⁵⁶	52.831 ⁶⁰	18.77 ²²⁶
15.9	57.521 ¹³⁴	63.26 ⁶¹	17.955 ¹²⁸	47.73 ⁷¹	33.399 ¹⁰⁸	72.70 ³⁶⁷	52.944 ¹¹³	16.32 ²⁴⁵
25.9	57.703 ¹⁸²	64.15 ⁸⁹	18.132 ¹⁷⁷	48.69 ⁹⁶	33.576 ¹⁷⁷	69.05 ³⁶⁵	53.104 ¹⁶⁰	13.72 ²⁶⁰
Dec. 5.9	57.932 ²²⁹	65.27 ¹¹²	18.355 ²²³	49.90 ¹²¹	33.824 ²⁴⁸	65.49 ³⁵⁶	53.311 ²⁰⁷	11.06 ²⁶⁶
	265	136	261	142	305	334	248	266
15.9	58.197	66.63	18.616	51.32	34.129	62.15	53.559	8.40
25.8	58.490 ²⁹³	68.18 ¹⁵⁵	18.907 ²⁹¹	52.92 ¹⁶⁰	34.487 ³⁵⁸	59.13 ³⁰²	53.841 ²⁸²	5.79 ²⁶¹
35.8	58.805 ³¹⁵	69.88 ¹⁷⁰	19.218 ³¹¹	54.66 ¹⁷⁴	34.889 ⁴⁰²	56.48 ²⁶⁵	54.149 ³⁰⁸	3.35 ²⁴⁴
Mean Place	56.361	62.65	16.824	47.08	34.589	81.99	52.444	20.51
Sec δ , Tan δ	1.026	-0.231	1.020	-0.201	1.632	+1.289	1.061	+0.356
$D\psi\alpha$, $D\omega\alpha$	+0.065	-0.013	+0.064	-0.011	+0.041	+0.070	+0.056	+0.019
$D\psi\delta$, $D\omega\delta$	-0.33	-0.56	-0.33	-0.57	-0.32	-0.58	-0.32	-0.58

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϕ Virginis. Mag. 5.0		δ Ursæ Minoris. Mag. 4.4		ρ Boötis. Mag. 3.8		γ Boötis. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 24 s	° ' " — 1 52 "	h m 14 27 s	° ' " +76 1 "	h m 14 28 s	° ' " +30 42 "	h m 14 28 s	° ' " +38 38 "
Jan. 0.8	13.323	55.11	35.33	66.49	29.614	27.34	57.408	33.94
10.8	13.632	57.05	36.21	64.45	29.944	24.98	57.759	31.54
20.8	13.948	58.92	37.16	63.00	30.284	22.99	58.123	29.58
30.7	14.260	60.66	38.15	62.22	30.626	21.44	58.490	28.14
Feb. 9.7	14.560	62.20	39.13	62.12	30.959	20.40	58.847	27.24
19.7	14.842	63.51	40.07	62.70	31.273	19.90	59.185	26.94
Mar. 1.7	15.099	64.55	40.94	63.90	31.561	19.92	59.497	27.21
11.6	15.328	65.30	41.71	65.70	31.820	20.45	59.774	28.02
21.6	15.527	65.78	42.36	68.00	32.042	21.47	60.012	29.34
31.6	15.696	65.97	42.86	70.70	32.226	22.86	60.208	31.08
Apr. 10.6	15.834	65.94	43.21	73.69	32.373	24.61	60.361	33.14
20.5	15.941	65.68	43.40	76.84	32.479	26.61	60.471	35.47
30.5	16.020	65.25	43.44	80.05	32.551	28.75	60.538	37.95
May 10.5	16.071	64.69	43.32	83.19	32.584	30.97	60.565	40.49
20.4	16.093	64.03	43.04	86.17	32.584	33.20	60.551	42.99
30.4	16.091	63.29	42.64	88.89	32.550	35.36	60.502	45.37
June 9.4	16.063	62.53	42.12	91.24	32.487	37.35	60.420	47.58
19.4	16.011	61.76	41.50	93.20	32.399	39.12	60.307	49.50
29.3	15.936	61.01	40.79	94.70	32.281	40.65	60.167	51.14
July 9.3	15.841	60.31	40.02	95.69	32.143	41.89	60.005	52.40
19.3	15.728	59.64	39.20	96.15	31.988	42.81	59.821	53.31
29.3	15.600	59.05	38.35	96.08	31.819	43.34	59.624	53.80
Aug. 8.2	15.463	58.53	37.50	95.47	31.640	43.54	59.418	53.87
18.2	15.320	58.11	36.66	94.32	31.457	43.37	59.208	53.53
28.2	15.179	57.80	35.85	92.69	31.278	42.80	59.003	52.78
Sept. 7.1	15.046	57.64	35.10	90.58	31.108	41.90	58.810	51.60
17.1	14.930	57.62	34.42	88.04	30.956	40.60	58.638	50.03
27.1	14.837	57.77	33.83	85.10	30.832	38.96	58.492	48.08
Oct. 7.1	14.776	58.12	33.36	81.84	30.738	36.97	58.384	45.76
17.0	14.753	58.68	33.00	78.31	30.688	34.67	58.319	43.15
27.0	14.775	59.48	32.80	74.59	30.682	32.14	58.304	40.26
Nov. 6.0	14.844	60.51	32.74	70.77	30.732	29.35	58.345	37.17
16.0	14.962	61.79	32.85	66.92	30.832	26.38	58.445	33.92
25.9	15.128	63.28	33.12	63.15	30.987	23.36	58.601	30.60
Dec. 5.9	15.339	64.97	33.56	59.55	31.195	20.27	58.814	27.30
15.9	15.589	66.81	34.14	56.26	31.444	17.27	59.074	24.11
25.8	15.869	68.75	34.86	53.35	31.736	14.39	59.379	21.13
35.8	16.172	70.73	35.70	50.94	32.054	11.79	59.717	18.45
Mean Place	13.995	60.45	40.037	78.11	30.727	31.48	58.702	40.00
Sec δ , Tan δ	1.001	−0.033	4.144	+4.022	1.163	+0.594	1.280	+0.800
$D\psi\alpha$, $D\omega\alpha$	+0.062	−0.002	−0.003	+0.214	+0.052	+0.032	+0.048	+0.042
$D\psi\delta$, $D\omega\delta$	−0.32	−0.59	−0.32	−0.60	−0.32	−0.60	−0.32	−0.61

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Centauri. Mag. 2.6		σ Boötis. Mag. 4.5		α^2 Centauri. Mag. 0.3		33 Boötis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 30	° ' -41 48	h m 14 31	° ' +30 4	h m 14 34	° ' -60 30	h m 14 35	° ' +44 43
	s	"	s	"	s	"	s	"
Jan. 0.8	36.114	56.09	18.597	40.49	21.47	40.87	56.866	62.82
10.8	36.511 397	56.91 82	18.925 328	38.11 238	22.02 55	41.10 23	57.233 367	60.36 216
20.8	36.916 405	58.06 115	19.266 341	36.09 202	22.58 56	41.83 73	57.620 387	58.38 198
30.7	37.317 401	59.48 142	19.606 340	34.52 157	23.14 56	43.03 120	58.012 392	56.95 143
Feb. 9.7	37.705 388	61.16 168	19.938 332	33.45 107	23.68 54	44.59 156	58.397 385	56.11 81
	365	188	315	53	51	194	369	23
19.7	38.070	63.04	20.253	32.92	24.19	46.53	58.766	55.88
Mar. 1.7	38.405 335	65.04 200	20.542 289	32.90 2	24.66 47	48.75 222	59.106 340	56.26 38
11.6	38.708 303	67.12 208	20.801 259	33.39 49	25.08 42	51.21 216	59.409 303	57.23 97
21.6	38.978 270	69.22 210	21.025 221	34.36 97	25.44 36	53.83 262	59.672 263	58.70 147
31.6	39.206 228	71.34 212	21.211 186	35.73 137	25.75 31	56.57 274	59.889 217	60.62 192
	191	207	150	172	25	281	170	228
Apr. 10.6	39.397	73.41	21.361	37.45	26.00	59.38	60.059	62.90
20.5	39.550 153	75.41 200	21.471 110	39.41 196	26.19 19	62.18 280	60.181 122	65.43 253
30.5	39.663 113	77.30 189	21.546 75	41.54 213	26.32 13	64.90 272	60.254 73	68.12 269
May 10.5	39.739 76	79.06 176	21.583 37	43.74 220	26.38 6	67.54 264	60.282 28	70.86 274
20.4	39.775 36	80.67 161	21.587 4	45.96 222	26.38 0	69.99 245	60.265 17	73.55 269
	1	142	29	215	6	225	58	255
30.4	39.774	82.09	21.558	48.11	26.32	72.24	60.207	76.10
June 9.4	39.736 38	83.28 119	21.500 58	50.09 198	26.21 11	74.25 201	60.111 96	78.46 236
19.4	39.660 76	84.27 99	21.415 85	51.89 180	26.04 23	75.94 169	59.980 131	80.52 206
29.3	39.552 108	84.97 70	21.303 112	53.42 153	25.81 17	77.30 136	59.818 162	82.25 173
July 9.3	39.411 141	85.41 44	21.169 131	54.67 125	25.54 27	78.27 97	59.631 187	83.60 135
	166	15	152	93	31	56	211	94
19.3	39.245	85.56	21.017	55.60	25.23	78.83	59.420	84.54
29.3	39.056 189	85.42 11	20.850 167	56.17 57	24.89 31	78.95 12	59.193 227	85.04 50
Aug. 8.2	38.853 203	84.98 44	20.673 177	56.39 22	24.53 36	78.65 30	58.956 237	85.10 6
18.2	38.643 210	84.23 75	20.490 183	56.26 13	24.17 36	77.92 73	58.715 211	84.69 41
28.2	38.436 207	83.23 100	20.312 178	55.74 52	23.82 35	76.78 111	58.478 237	83.83 86
	195	123	169	87	33	152	225	130
Sept. 7.1	38.241	82.00	20.143	54.87	23.49	75.26	58.253	82.53
17.1	38.069 172	80.57 143	19.990 153	53.61 126	23.20 29	73.37 189	58.050 203	80.81 172
27.1	37.931 138	79.03 154	19.864 126	52.01 160	22.97 23	71.24 213	57.876 171	78.69 212
Oct. 7.1	37.838 93	77.41 162	19.771 93	50.09 192	22.80 17	68.94 230	57.740 136	76.20 219
17.0	37.797 41	75.78 163	19.717 54	47.84 225	22.71 9	66.54 210	57.651 89	73.40 280
	20	155	6	251	1	210	35	309
27.0	37.817	74.23	19.711	45.33	22.72	64.14	57.616	70.31
Nov. 6.0	37.899 82	72.84 139	19.756 45	42.59 274	22.82 10	61.83 231	57.640 24	67.01 330
16.0	38.047 148	71.70 114	19.856 100	39.66 293	23.01 19	59.74 209	57.728 88	63.57 341
25.9	38.260 213	70.83 87	20.007 151	36.64 302	23.29 28	57.93 181	57.878 150	60.07 350
Dec. 5.9	38.528 269	70.32 51	20.211 204	33.58 306	23.66 37	56.51 142	58.089 142	56.60 317
	318	17	248	300	44	101	267	333
15.9	38.847	70.15	20.459	30.58	24.10	55.50	58.356	53.27
25.8	39.205 358	70.38 23	20.747 288	27.73 285	24.59 49	54.97 53	58.671 315	50.19 308
35.8	39.591 386	71.00 62	21.063 316	25.11 262	25.12 53	54.95 2	59.024 353	47.43 276
Mean Place	36.617	73.39	19.714	44.32	21.402	66.45	58.373	69.76
Sec δ , Tan δ	1.342	-0.895	1.156	+0.579	2.032	-1.769	1.408	+0.991
$D\psi_a, D\omega_a$	+0.076	-0.047	+0.052	+0.031	+0.090	-0.092	+0.045	+0.051
$D\psi_\delta, D\omega_\delta$	-0.32	-0.61	-0.31	-0.61	-0.31	-0.62	-0.31	-0.63

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Apodis. Mag. 3.8		μ Virginis. Mag. 4.0		ϵ Boötis. Mag. 2.7		109 Virginis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 38 s	° ' " -78 42 "	h m 14 38 s	° ' " - 5 19 "	h m 14 41 s	° ' " +27 23 "	h m 14 42 s	° ' " + 2 12 "
Jan. 0.8	11.70	46.81	59.279	20.40	36.340	50.40	20.472	64.24
10.8	12.96 ¹²⁶	46.39 ⁴²	59.586 ³⁰⁷	22.25 ¹⁸⁵	36.657 ³¹⁷	47.98 ²⁴²	20.774 ³⁰²	62.22 ²⁰²
20.8	14.26 ¹³⁰	46.51 ¹²	59.902 ³¹⁶	24.05 ¹⁸⁰	36.987 ³³⁰	45.90 ²⁰⁸	21.086 ³¹²	60.32 ¹⁹⁰
30.8	15.58 ¹³²	47.20 ⁶⁹	60.216 ³¹⁴	25.75 ¹⁷⁰	37.320 ³³³	44.23 ¹⁶⁷	21.398 ³¹²	58.59 ¹⁷³
Feb. 9.7	16.87 ¹²⁹	48.41 ¹²¹	60.522 ³⁰⁶	27.32 ¹⁵⁷	37.647 ³²⁷	43.07 ¹¹⁶	21.700 ³⁰²	57.10 ¹⁴⁹
19.7	18.11 ¹²⁴	50.11 ¹⁷⁰	60.811 ²⁸⁹	28.69 ¹³⁷	37.959 ³¹²	42.40 ⁶⁷	21.987 ²⁸⁷	55.89 ¹²¹
Mar. 1.7	19.26 ¹¹⁵	52.22 ²¹¹	61.078 ²⁶⁷	29.82 ¹¹³	38.246 ²⁸⁷	42.23 ¹⁷	22.254 ²⁶⁷	54.98 ⁹¹
11.6	20.32 ¹⁰⁸	54.73 ²⁵¹	61.318 ²⁴⁰	30.69 ⁸⁷	38.508 ²⁶²	42.57 ³⁴	22.493 ²³⁹	54.39 ⁵⁹
21.6	21.25 ⁹³	57.53 ²⁸⁰	61.530 ²¹²	31.30 ⁶¹	38.734 ²²⁶	43.38 ⁸¹	22.706 ²¹³	54.11 ²⁸
31.6	22.05 ⁸⁰	60.58 ³⁰⁵	61.715 ¹⁸⁵	31.67 ³⁷	38.927 ¹⁹³	44.59 ¹²¹	22.891 ¹⁸⁵	54.14 ³
Apr. 10.6	22.70 ⁶⁵	63.81 ³²³	61.868 ¹⁵³	31.80 ¹³	39.086 ¹⁵⁹	46.16 ¹⁵⁷	23.043 ¹⁵²	54.42 ²⁸
20.5	23.20 ⁵⁰	67.12 ³³¹	61.992 ¹²⁴	31.74 ⁶	39.206 ¹²⁰	47.99 ¹⁸³	23.167 ¹²⁴	54.94 ⁵²
30.5	23.53 ³³	70.49 ³³⁷	62.087 ⁹⁵	31.50 ²⁴	39.292 ⁸⁶	50.01 ²⁰²	23.261 ⁹⁴	55.64 ⁷⁰
May 10.5	23.69 ¹⁶	73.80 ³³¹	62.154 ⁶⁷	31.12 ³⁸	39.342 ⁵⁰	52.12 ²¹¹	23.327 ⁶⁶	56.48 ⁸⁴
20.4	23.69 ⁰	77.02 ³²²	62.193 ³⁹	30.64 ⁴⁸	39.360 ¹⁸	54.28 ²¹⁶	23.364 ³⁷	57.39 ⁹¹
30.4	23.52 ¹⁷	80.02 ³⁰⁰	62.206 ¹³	30.07 ⁵⁷	39.342 ¹⁸	56.37 ²⁰⁹	23.375 ¹¹	58.37 ⁹⁸
June 9.4	23.19 ³³	82.81 ²⁷⁹	62.190 ¹⁶	29.46 ⁶¹	39.296 ⁴⁶	58.33 ¹⁹⁶	23.359 ¹⁶	59.35 ⁹⁸
19.4	22.71 ⁶³	85.27 ²⁴⁶	62.150 ⁴⁰	28.81 ⁶⁵	39.224 ⁷²	60.12 ¹⁷⁹	23.316 ⁴³	60.32 ⁹⁷
29.3	22.08 ⁴³	87.36 ²⁰⁹	62.083 ⁶⁷	28.17 ⁶⁴	39.122 ¹⁰²	61.69 ¹⁵⁷	23.249 ⁶⁷	61.24 ⁹²
July 9.3	21.33 ⁷⁵	89.03 ¹⁶⁷	61.995 ⁸⁸	27.53 ⁶⁴	38.997 ¹²⁵	62.99 ¹³⁰	23.159 ⁹⁰	62.08 ⁸⁴
19.3	20.48 ⁸⁵	90.18 ¹¹⁵	61.886 ¹⁰⁹	26.93 ⁶⁰	38.852 ¹⁴⁵	63.98 ⁹⁹	23.049 ¹¹⁰	62.82 ⁷⁴
29.3	19.56 ⁹²	90.85 ⁶⁷	61.759 ¹²⁷	26.36 ⁵⁷	38.694 ¹⁵⁸	64.64 ⁶⁶	22.922 ¹²⁷	63.44 ⁶²
Aug. 8.2	18.58 ⁹⁸	90.96 ¹¹	61.620 ¹³⁹	25.85 ⁵¹	38.520 ¹⁷⁴	64.99 ³⁵	22.782 ¹⁴⁰	63.95 ⁵¹
18.2	17.59 ⁹⁹	90.56 ⁴⁰	61.474 ¹⁴⁶	25.41 ⁴⁴	38.343 ¹⁷⁷	64.94 ⁵	22.635 ¹⁴⁷	64.32 ³⁷
28.2	16.63 ⁹⁶	89.58 ⁹⁸	61.327 ¹⁴⁷	25.03 ³⁸	38.164 ¹⁷⁹	64.56 ³⁸	22.487 ¹⁴⁸	64.53 ²¹
Sept. 7.1	15.73 ⁹⁰	88.14 ¹⁴⁴	61.188 ¹³⁹	24.76 ²⁷	37.993 ¹⁷¹	63.85 ⁷¹	22.344 ¹⁴³	64.58 ⁵
17.1	14.92 ⁸¹	86.20 ¹⁹⁴	61.062 ¹²⁶	24.62 ¹⁴	37.838 ¹⁵⁵	62.75 ¹¹⁰	22.215 ¹²⁹	64.44 ¹⁴
27.1	14.26 ⁶⁶	83.86 ²³⁴	60.958 ¹⁰⁴	24.62 ⁰	37.708 ¹³⁰	61.31 ¹⁴⁴	22.108 ¹⁰⁷	64.11 ³³
Oct. 7.1	13.75 ⁵¹	81.22 ²⁶⁴	60.886 ⁷²	24.79 ¹⁷	37.609 ⁹⁹	59.53 ¹⁷⁸	22.031 ⁷⁷	63.56 ⁵⁵
17.0	13.44 ³¹	78.35 ²⁸⁷	60.849 ³⁷	25.15 ³⁶	37.546 ⁶³	57.44 ²⁰⁹	21.989 ⁴²	62.80 ⁷⁶
27.0	13.35 ⁹	75.37 ²⁹⁸	60.857 ⁸	25.73 ⁵⁸	37.530 ¹⁶	55.09 ²³⁵	21.991 ²	61.78 ¹⁰²
Nov. 6.0	13.48 ¹³	72.42 ²⁹⁵	60.914 ⁵⁷	26.54 ⁸¹	37.565 ³⁵	52.48 ²⁶¹	22.041 ⁵⁰	60.52 ¹²⁶
16.0	13.84 ³⁶	69.60 ²⁸²	61.020 ¹⁰⁶	27.60 ¹⁰⁶	37.654 ⁸⁹	49.69 ²⁷⁹	22.139 ⁹⁸	59.04 ¹⁴⁸
25.9	14.41 ⁵⁷	67.00 ²⁶⁰	61.176 ¹⁵⁶	28.87 ¹²⁷	37.794 ¹⁴⁰	46.76 ²⁹³	22.286 ¹⁴⁷	57.34 ¹⁷⁰
Dec. 5.9	15.19 ⁷⁸	64.76 ²²⁴	61.377 ²⁰¹	30.34 ¹⁴⁷	37.985 ¹⁹¹	43.78 ²⁹⁸	22.479 ²⁹³	55.47 ¹⁸⁷
15.9	16.14 ⁹⁵	62.94 ¹⁸²	61.618 ²⁴¹	32.00 ¹⁶⁶	38.220 ²³⁵	40.84 ²⁹⁴	22.714 ²³⁵	53.49 ¹⁹⁸
25.8	17.23 ¹⁰⁹	61.65 ¹²⁹	61.892 ²⁷⁴	33.79 ¹⁷⁹	38.495 ²⁷⁵	38.01 ²⁸³	22.980 ²⁸⁶	51.44 ²⁰⁵
35.8	18.44 ¹²¹	60.89 ⁷⁶	62.191 ²⁹⁹	35.64 ¹⁸⁵	38.801 ³⁰⁶	35.37 ²⁶⁴	23.273 ²⁹³	49.37 ²⁰⁷
Mean Place	12.870	70.47	60.005	27.25	37.456	53.00	21.276	59.58
Sec δ , Tan δ	5.112	-5.013	1.004	-0.093	1.126	+0.518	1.001	+0.039
$D\psi\alpha$, $D\omega\alpha$	+0.146	-0.258	+0.063	-0.005	+0.052	+0.026	+0.060	+0.002
$D\psi\delta$, $D\omega\delta$	-0.31	-0.64	-0.31	-0.64	-0.30	-0.65	-0.30	-0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	8 Libræ. Mag. 5.3		α Libræ. Mag. 2.9		Groombridge 2164. Mag. 5.7		β Ursæ Minoris. Mag. 2.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 46	° ' -15 40	h m 14 46	° ' -15 43	h m 14 49	° ' +59 35	h m 14 50	° ' +74 27
	s	"	s	"	s	"	s	"
Jan. 0.8	24.742	30.30	36.191	11.39	26.720	74.53	50.34	62.68
10.8	25.057 ³¹⁵	31.82 ¹⁵²	36.505 ³¹¹	12.92 ¹⁵³	27.176 ⁴⁵⁶	72.01 ²⁵²	51.10 ⁷⁸	60.33 ²³⁵
20.8	25.382 ³²⁵	33.41 ¹⁵⁹	36.830 ³²⁵	14.49 ¹⁵⁷	27.665 ¹⁸⁰	70.03 ¹⁹⁸	51.94 ⁸⁴	58.57 ¹⁷⁶
30.8	25.707 ³²⁵	35.02 ¹⁶¹	37.154 ³²⁴	16.11 ¹⁶²	28.172 ⁵⁰⁷	68.67 ¹³⁶	52.82 ⁸⁸	57.45 ¹¹²
Feb. 9.7	26.023 ³¹⁶	36.60 ¹⁵⁸	37.470 ³¹⁶	17.69 ¹⁵⁸	28.681 ⁵⁰⁹	67.97 ⁷⁰	53.71 ⁸⁹	57.00 ⁴⁵
	300	150	299	150	493	4	87	23
19.7	26.323	38.10	37.769	19.19	29.174	67.93	54.58	57.23
Mar. 1.7	26.601 ²⁷⁸	39.46 ¹³⁶	38.049 ²⁸⁰	20.53 ¹³⁴	29.635 ⁴⁶¹	68.55 ⁶²	55.40 ⁸²	58.13 ⁹⁰
11.6	26.855 ²⁵⁴	40.66 ¹²⁰	38.303 ²⁵⁴	21.74 ¹²¹	30.054 ⁴¹⁹	69.79 ¹²⁴	56.14 ⁷⁴	59.62 ¹⁴⁹
21.6	27.082 ²²⁷	41.70 ¹⁰⁴	38.531 ²²⁸	22.79 ¹⁰⁵	30.419 ³⁶⁵	71.61 ¹⁸²	56.79 ⁶⁵	61.68 ²⁰⁶
31.6	27.279 ¹⁹⁷	42.56 ⁸⁶	38.727 ¹⁹⁶	23.65 ⁸⁶	30.720 ³⁰¹	73.87 ²²⁶	57.32 ⁵³	64.18 ²⁵⁰
	166	67	168	70	235	265	39	286
Apr. 10.6	27.445	43.23	38.895	24.35	30.955	76.52	57.71	67.04
20.5	27.583 ¹³⁸	43.73 ⁵⁰	39.032 ¹³⁷	24.86 ⁵¹	31.120 ¹⁶⁵	79.42 ²⁹⁰	57.97 ²⁶	70.12 ³⁰⁸
30.5	27.690 ¹⁰⁷	44.09 ³⁶	39.141 ¹⁰⁹	25.20 ³⁴	31.214 ⁹¹	82.48 ³⁰⁶	58.08 ¹¹	73.32 ³²⁰
May 10.5	27.770 ⁸⁰	44.31 ²²	39.219 ⁷⁸	25.43 ²³	31.236 ²²	85.59 ³¹¹	58.06 ²	76.53 ³²¹
20.5	27.820 ⁵⁰	44.41 ¹⁰	39.271 ⁵²	25.52 ⁹	31.193 ⁴³	88.62 ³⁰³	57.90 ¹⁶	79.62 ³⁰⁹
	21	3	20	1	106	288	29	288
30.4	27.841	44.38	39.291	25.51	31.087	91.50	57.61	82.50
June 9.4	27.832 ⁹	44.28 ¹⁰	39.284 ⁷	25.44 ⁷	30.922 ¹⁶⁵	94.12 ²⁶²	57.21 ⁴⁰	85.10 ²⁶⁰
19.4	27.798 ³¹	44.10 ¹⁸	39.248 ³⁶	25.24 ²⁰	30.704 ²¹⁸	96.40 ²²⁸	56.70 ⁵¹	87.33 ²²³
29.3	27.735 ⁶³	43.83 ²⁷	39.185 ⁶³	24.96 ²⁸	30.439 ²⁶⁵	98.31 ¹⁹¹	56.11 ⁵⁹	89.12 ¹⁷⁹
July 9.3	27.648 ⁸⁷	43.50 ³³	39.099 ⁸⁶	24.63 ³³	30.136 ³⁰³	99.77 ¹⁴⁶	55.44 ⁶⁷	90.44 ¹³²
	111	39	112	40	335	99	72	82
19.3	27.537	43.11	38.987	24.23	29.801	100.76	54.72	91.26
29.3	27.406 ¹³¹	42.65 ⁴⁶	38.855 ¹³²	23.77 ⁴⁶	29.443 ³⁵⁸	101.26 ⁵⁰	53.96 ⁷⁶	91.54 ²⁸
Aug. 8.2	27.262 ¹⁴⁴	42.15 ⁵⁰	38.712 ¹⁴³	23.29 ⁴⁸	29.070 ³⁷⁷	101.23 ³	53.19 ⁷⁷	91.30 ²⁴
18.2	27.109 ¹⁵³	41.62 ⁵³	38.558 ¹⁵⁴	22.76 ⁵³	28.693 ³⁷³	100.70 ⁵³	52.41 ⁷⁸	90.52 ⁷⁸
28.2	26.954 ¹⁵⁵	41.07 ⁵⁵	38.404 ¹⁵⁴	22.20 ⁵⁶	28.320 ³⁷³	99.69 ¹⁰¹	51.64 ⁷⁷	89.23 ¹²⁹
	150	56	149	55	355	154	72	179
Sept. 7.2	26.804	40.51	38.255	21.65	27.965	98.15	50.92	87.44
17.1	26.669 ¹³⁵	40.00 ⁵¹	38.119 ¹³⁶	21.12 ⁵³	27.637 ³²⁸	96.17 ¹⁹⁸	50.25 ⁶⁷	85.19 ²²⁵
27.1	26.557 ¹¹²	39.54 ⁴⁶	38.007 ¹¹²	20.67 ⁴⁵	27.348 ²⁸⁹	93.74 ²⁴³	49.65 ⁶⁰	82.54 ²⁶⁵
Oct. 7.1	26.476 ⁸¹	39.18 ³⁶	37.925 ⁸²	20.30 ³⁷	27.109 ²³⁹	90.94 ²⁸⁰	49.14 ⁵¹	79.48 ³⁰⁶
17.0	26.434 ⁴²	38.95 ²³	37.885 ⁴⁰	20.07 ²³	26.930 ¹⁷⁹	87.79 ³¹⁵	48.75 ³⁹	76.13 ³³⁵
	2	4	0	5	107	342	27	360
27.0	26.436	38.91	37.885	20.02	26.823	84.37	48.48	72.53
Nov. 6.0	26.489 ⁵³	39.06 ¹⁵	37.939 ⁵⁴	20.15 ¹³	26.793 ³⁰	80.74 ³⁶³	48.34 ¹⁴	68.76 ³⁷⁷
16.0	26.594 ¹⁰⁵	39.44 ³⁸	38.043 ¹⁰⁴	20.53 ³⁸	26.846 ⁵³	76.98 ³⁷⁶	48.36 ²	64.91 ³⁸⁵
25.9	26.750 ¹⁵⁶	40.06 ⁶²	38.199 ¹⁵⁶	21.17 ⁶⁴	26.983 ¹³⁷	73.21 ³⁷⁷	48.52 ¹⁶	61.09 ³⁸²
Dec. 5.9	26.953 ²⁰³	40.93 ⁸⁷	38.401 ²⁰²	22.03 ⁸⁶	27.205 ²²²	69.50 ³⁷¹	48.84 ³²	57.39 ³⁷⁰
	246	110	246	111	299	352	45	346
15.9	27.199	42.03	38.647	23.14	27.504	65.98	49.29	53.93
25.9	27.480 ²⁸¹	43.34 ¹³¹	38.928 ²⁸¹	24.43 ¹²⁹	27.874 ³⁷⁰	62.75 ³²³	49.89 ⁶⁰	50.80 ³¹³
35.8	27.784 ³⁰⁴	44.80 ¹⁴⁶	39.231 ³⁰³	25.89 ¹⁴⁶	28.303 ⁴²⁹	59.91 ²⁸⁴	50.59 ⁷⁰	48.10 ²⁷⁰
Mean Place	25.445	40.47	36.895	21.59	29.048	83.04	54.862	72.48
Sec δ , Tan δ	1.039	-0.281	1.039	-0.282	1.977	+1.705	3.735	+3.599
$D\psi\alpha$, $D\omega\alpha$	+0.006	-0.014	+0.066	-0.014	+0.031	+0.084	-0.004	+0.176
$D\psi\delta$, $D\omega\delta$	-0.30	-0.66	-0.30	-0.66	-0.29	-0.67	-0.29	-0.68

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Piazzi 221. Mag. 5.8		ξ ² Libræ. Mag. 5.6		β Lupi. Mag. 2.8		δ Libræ. Var. 4.8-6.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 52	° ' " +14 45	h m 14 52	° ' " -11 5	h m 14 53	° ' " -42 49	h m 14 56	° ' " - 8 12
	s	"	s	"	s	"	s	"
Jan. 0.8	34.092	25.32	34.425	50.41	27.968	12.38	50.503	43.33
10.8	34.392 ³⁰⁰	23.05 ²²⁷	34.732 ³⁰⁷	52.04 ¹⁶³	28.362 ³⁹¹	12.93 ⁵⁵	50.807 ³⁰⁴	45.03 ¹⁷⁰
20.8	34.703 ³¹¹	21.00 ²⁰⁵	35.050 ³¹⁸	53.69 ¹⁶⁵	28.769 ⁴⁰⁷	13.80 ⁸⁷	51.119 ³¹²	46.72 ¹⁶⁹
30.8	35.019 ³¹⁶	19.24 ¹⁷⁶	35.368 ³¹⁸	55.32 ¹⁶³	29.176 ⁴⁰⁷	14.98 ¹¹⁸	51.435 ³¹⁶	48.35 ¹⁶³
Feb. 9.7	35.328 ³⁰⁹	17.85 ¹³⁹	35.681 ³¹³	56.85 ¹⁵³	29.575 ³⁹⁹	16.40 ¹⁴²	51.743 ³⁰⁸	49.87 ¹⁵²
	295	100	296	141	383	163	296	136
19.7	35.623	16.85	35.977	58.26	29.958	18.03	52.039	51.23
Mar. 1.7	35.898 ²⁷⁵	16.28 ⁵⁷	36.253 ²⁷⁶	59.49 ¹²³	30.316 ³⁵⁸	19.83 ¹⁸⁰	52.315 ²⁷⁶	52.38 ¹¹⁵
11.7	36.149 ²⁵¹	16.14 ¹⁴	36.507 ²⁵⁴	60.52 ¹⁰³	30.644 ³²⁸	21.74 ¹⁹¹	52.569 ²⁵⁴	53.32 ⁹⁴
21.6	36.372 ²²³	16.38 ²⁴	36.732 ²²⁵	61.36 ⁸⁴	30.938 ²⁹¹	23.70 ¹⁹⁶	52.795 ²²⁶	54.02 ⁷⁰
31.6	36.565 ¹⁹³	17.02 ⁶⁴	36.932 ²⁰⁰	61.97 ⁶¹	31.200 ²⁶²	25.70 ²⁰⁰	52.995 ²⁰⁰	54.48 ⁴⁶
	163	94	168	41	222	197	173	26
Apr. 10.6	36.728	17.96	37.100	62.38	31.422	27.67	53.168	54.74
20.5	36.859 ¹³¹	19.17 ¹²¹	37.241 ¹⁴¹	62.61 ²³	31.607 ¹⁸⁵	29.62 ¹⁹⁵	53.311 ¹⁴³	54.78 ⁴
30.5	36.959 ¹⁰⁰	20.57 ¹⁴⁰	37.352 ¹¹¹	62.68 ⁷	31.755 ¹⁴⁸	31.50 ¹⁸⁸	53.424 ¹¹³	54.67 ¹¹
May 10.5	37.028 ⁶⁹	22.10 ¹⁵³	37.435 ⁸³	62.60 ⁸	31.860 ¹⁰⁵	33.27 ¹⁷⁷	53.509 ⁸⁵	54.41 ²¹
20.5	37.067 ³⁹	23.71 ¹⁶¹	37.490 ⁵⁵	62.41 ¹⁹	31.927 ⁰⁷	34.92 ¹⁶⁵	53.565 ⁵⁶	54.06 ³⁵
	9	161	26	28	28	151	29	43
30.4	37.076	25.32	37.516	62.13	31.955	36.43	53.594	53.63
June 9.4	37.059 ¹⁷	26.88 ¹⁵⁶	37.512 ⁴	61.80 ³³	31.941 ¹⁴	37.75 ¹³²	53.594 ⁰	53.13 ⁵⁰
19.4	37.012 ⁴⁷	28.35 ¹⁴⁷	37.483 ²⁹	61.39 ¹¹	31.888 ⁵³	38.86 ¹¹¹	53.566 ²⁸	52.59 ⁵⁴
29.4	36.940 ⁷²	29.68 ¹³³	37.424 ⁵⁹	60.95 ⁴⁴	31.796 ⁹²	39.75 ⁸⁹	53.511 ⁵⁵	52.03 ⁵⁶
July 9.3	36.843 ⁹⁷	30.83 ¹¹⁵	37.341 ⁸³	60.49 ⁴⁶	31.669 ¹²⁷	40.37 ⁶²	53.430 ⁸¹	51.47 ⁵⁶
	118	95	105	19	159	36	104	55
19.3	36.725	31.78	37.236	60.00	31.510	40.73	53.326	50.92
29.3	36.589 ¹³⁶	32.51 ⁷³	37.110 ¹²⁶	59.49 ⁵¹	31.324 ¹⁸⁶	40.78 ⁵	53.202 ¹²⁴	50.38 ⁵⁴
Aug. 8.2	36.440 ¹⁴⁹	32.99 ⁴⁸	36.968 ¹⁴²	58.99 ⁵⁰	31.117 ²⁰⁷	40.56 ²²	53.062 ¹⁴⁰	49.87 ⁵¹
18.2	36.280 ¹⁶⁰	33.23 ²⁴	36.818 ¹⁵⁰	58.50 ⁴⁹	30.901 ²¹⁶	40.03 ⁵³	52.912 ¹⁵⁰	49.40 ⁴⁷
28.2	36.120 ¹⁶⁰	33.20 ³	36.665 ¹⁵³	58.03 ⁴⁷	30.680 ²²¹	39.23 ⁸⁰	52.759 ¹⁵³	48.99 ⁴¹
	157	29	150	43	211	108	149	34
Sept. 7.2	35.963	32.91	36.515	57.60	30.466	38.15	52.610	48.65
17.1	35.820 ¹⁴³	32.33 ⁵⁸	36.379 ¹³⁶	57.25 ³⁵	30.274 ¹⁹²	36.87 ¹²⁸	52.472 ¹³⁸	48.41 ²¹
27.1	35.698 ¹²²	31.47 ⁸⁶	36.265 ¹¹⁴	57.00 ²⁵	30.112 ¹⁶²	35.41 ¹⁴⁶	52.356 ¹¹⁶	48.28 ¹³
Oct. 7.1	35.603 ⁹⁵	30.32 ¹¹⁵	36.180 ⁸⁵	56.88 ¹²	29.990 ¹²²	33.85 ¹⁵⁶	52.267 ⁸⁹	48.31 ³
17.1	35.544 ⁵⁹	28.91 ¹⁴¹	36.132 ⁴⁸	56.90 ²	29.921 ⁶⁹	32.24 ¹⁶¹	52.215 ⁵²	48.49 ¹⁸
	15	171	4	21	10	157	9	38
27.0	35.529	27.20	36.128	57.11	29.911	30.67	52.206	48.87
Nov. 6.0	35.560 ³¹	25.26 ¹⁹⁴	36.174 ⁴⁶	57.54 ⁴³	29.966 ⁵⁵	29.20 ¹⁴⁷	52.246 ⁴⁰	49.46 ⁵⁹
16.0	35.642 ⁸²	23.10 ²¹⁶	36.269 ⁹⁵	58.20 ⁶⁶	30.086 ¹²⁰	27.93 ¹²⁷	52.335 ⁸⁹	50.28 ⁸²
25.9	35.773 ¹³¹	20.75 ²³⁵	36.417 ¹⁴⁸	59.08 ⁸⁸	30.272 ¹⁸⁶	26.90 ¹⁰³	52.474 ¹³⁹	51.33 ¹⁰⁵
Dec. 5.9	35.952 ¹⁷⁹	18.29 ²⁴³	36.610 ¹⁹³	60.19 ¹¹¹	30.520 ²⁴⁸	26.18 ⁷²	52.661 ¹⁸⁷	52.59 ¹²⁶
	224	256	236	132	301	39	230	144
15.9	36.176	15.76	36.846	61.51	30.821	25.79	52.891	54.03
25.9	36.434 ²⁵⁸	13.26 ²⁵⁰	37.117 ²⁷¹	62.98 ¹⁴⁷	31.168 ³⁴⁷	25.77 ²	53.155 ²⁶⁴	55.62 ¹⁵⁹
35.8	36.722 ²⁸⁸	10.86 ²⁴⁰	37.414 ²⁹⁷	64.57 ¹⁵⁰	31.546 ³⁷⁸	26.13 ³⁶	53.447 ²⁹²	57.31 ¹⁶⁹
Mean Place	35.073	23.96	35.187	59.34	28.669	29.92	51.305	51.49
Sec δ, Tan δ	1.034	+0.263	1.019	-0.196	1.363	-0.927	1.010	-0.144
Dψα, Dωα	+0.056	+0.013	+0.065	-0.010	+0.078	-0.045	+0.064	-0.007
Dψδ, Dωδ	-0.29	-0.68	-0.29	-0.68	-0.29	-0.69	-0.29	-0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Boötis. Mag. 3.6		γ Scorpii. Mag. 3.4		ψ Boötis. Mag. 4.7		ϵ Boötis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 14 59 s	° ' +40 41 "	h m 14 59 s	° ' -24 58 "	h m 15 1 s	° ' +27 14 "	h m 15 3 s	° ' +25 9 "
Jan. 0.8	1.244	32.09	32.801	35.75	7.556	47.96	53.957	64.50
10.8	1.582 338	29.47 262	33.129 328	36.88 113	7.861 305	45.45 251	54.259 302	62.01 249
20.8	1.941 359	27.29 218	33.467 338	38.17 129	8.184 323	43.27 218	54.577 318	59.82 219
30.8	2.308 367	25.57 172	33.809 342	39.57 110	8.513 329	41.50 177	54.904 327	58.04 178
Feb. 9.7	2.676 368	24.46 111	34.143 334	41.08 151	8.840 327	40.19 131	55.227 323	56.69 135
	355	53	321	151	316	80	313	86
19.7	3.031	23.93	34.464	42.59	9.156	39.39	55.540	55.83
Mar. 1.7	3.365 331	24.00 7	34.763 299	44.07 148	9.452 296	39.10 29	55.834 294	55.48 35
11.7	3.671 306	24.67 67	35.040 277	45.49 142	9.723 271	39.34 24	56.105 271	55.62 14
21.6	3.941 270	25.86 119	35.289 249	46.83 134	9.964 241	40.05 71	56.345 210	56.25 63
31.6	4.174 233	27.53 167	35.511 222	48.06 123	10.174 210	41.21 116	56.556 211	57.29 104
	189	205	192	112	175	151	177	141
Apr. 10.6	4.363	29.58	35.703	49.18	10.349	42.72	56.733	58.70
20.5	4.511 148	31.91 233	35.864 161	50.16 98	10.490 141	44.54 182	56.877 144	60.41 171
30.5	4.615 104	34.46 255	35.993 129	51.04 88	10.594 104	46.55 201	56.986 109	62.33 192
May 10.5	4.674 59	37.11 250	36.091 98	51.78 71	10.666 72	48.70 215	57.061 75	64.39 206
20.5	4.692 18	39.81 267	36.158 67	52.40 62	10.702 36	50.89 219	57.102 41	66.50 211
	22	259	35	51	2	217	9	209
30.4	4.670	42.40	36.193	52.91	10.704	53.06	57.111	68.59
June 9.4	4.610 60	44.83 243	36.195 2	53.28 37	10.676 28	55.13 207	57.089 22	70.58 199
19.4	4.512 98	47.02 219	36.168 27	53.57 29	10.615 61	57.03 190	57.035 54	72.43 185
29.4	4.384 128	48.91 189	36.108 60	53.71 14	10.528 87	58.71 168	56.952 83	74.08 165
July 9.3	4.224 160	50.48 157	36.023 85	53.70 1	10.411 117	60.14 143	56.845 107	75.50 142
	185	116	116	10	139	113	133	112
19.3	4.039	51.64	35.907	53.60	10.272	61.27	56.712	76.62
29.3	3.832 207	52.40 76	35.770 137	53.34 26	10.115 157	62.08 81	56.560 152	77.46 84
Aug. 8.2	3.614 218	52.77 37	35.615 155	52.95 39	9.940 175	62.56 48	56.391 169	77.95 49
18.2	3.385 229	52.66 11	35.448 167	52.44 51	9.757 183	62.67 11	56.212 179	78.13 18
28.2	3.155 230	52.14 52	35.277 171	51.81 63	9.570 187	62.44 23	56.030 182	77.94 19
	223	98	169	72	181	60	178	53
Sept. 7.2	2.932	51.16	35.108	51.09	9.389	61.84	55.852	77.41
17.1	2.724 208	49.74 142	34.957 151	50.32 77	9.220 169	60.87 97	55.687 165	76.53 88
27.1	2.541 183	47.93 181	34.827 130	49.53 79	9.071 149	59.55 132	55.541 146	75.29 124
Oct. 7.1	2.392 149	45.74 219	34.729 98	48.75 78	8.953 118	57.89 166	55.425 116	73.72 157
17.1	2.286 106	43.21 253	34.672 57	48.03 72	8.871 82	55.90 199	55.344 81	71.84 188
	61	286	8	59	38	229	37	219
27.0	2.225	40.35	34.664	47.44	8.833	53.61	55.307	69.65
Nov. 6.0	2.224 1	37.23 312	34.705 41	47.00 44	8.845 12	51.07 254	55.318 11	67.20 245
16.0	2.280 56	33.95 328	34.802 97	46.78 22	8.909 61	48.31 276	55.381 63	64.54 266
25.9	2.399 119	30.57 338	34.954 132	46.79 1	9.028 119	45.39 292	55.498 117	61.73 281
Dec. 5.9	2.576 177	27.16 341	35.159 205	47.07 28	9.198 170	42.42 297	55.666 168	58.82 291
	233	334	248	53	218	298	215	291
15.9	2.809	23.82	35.407	47.60	9.416	39.44	55.881	55.91
25.9	3.090 281	20.66 316	35.695 288	48.41 81	9.673 257	36.55 289	56.135 254	53.06 285
35.8	3.407 317	17.76 290	36.010 315	49.42 101	9.966 293	33.85 270	56.424 289	50.38 268
Mean Place	2.742	36.77	33.547	48.75	8.757	49.48	55.135	65.37
Sec δ , Tan δ	1.319	+0.860	1.103	-0.466	1.125	+0.515	1.105	+0.470
$D\psi\alpha$, $D\omega\alpha$	+0.045	+0.041	+0.070	-0.022	+0.051	+0.024	+0.052	+0.022
$D\psi\delta$, $D\omega\delta$	-0.28	-0.70	-0.28	-0.71	-0.28	-0.71	-0.28	-0.72

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Lupi. Mag. 3.5		ι Libræ. Mag. 4.7		3 Serpentinis. Mag. 5.4		γ Triang. Aust. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 6	° ' " -51 48	h m 15 7	° ' " -19 29	h m 15 11	° ' " + 5 13	h m 15 11	° ' " -68 23
	s	"	s	"	s	"	s	"
Jan. 0.9	43.709	6.29	48.874	53.53	20.625	32.29	40.38	26.22
10.8	44.153 ⁴⁴⁴	6.34 ⁵	49.187 ³¹³	54.79 ¹²⁶	20.912 ²⁸⁷	30.23 ²⁰⁶	41.06 ⁶⁸	25.64 ⁵⁸
20.8	44.617 ⁴⁶⁴	6.82 ⁴⁸	49.513 ³²⁶	56.18 ¹³⁹	21.215 ³⁰³	28.30 ¹⁹³	41.78 ⁷²	25.54 ¹⁰
30.8	45.089 ⁴⁷²	7.65 ⁸³	49.842 ³²⁹	57.62 ¹⁴⁴	21.524 ³⁰⁹	26.57 ¹⁷³	42.52 ⁷⁴	25.93 ³⁹
Feb. 9.7	45.553 ⁴⁶⁴	8.83 ¹¹⁸	50.166 ³²⁴	59.07 ¹⁴⁵	21.827 ³⁰³	25.08 ¹⁴⁹	43.26 ⁷¹	26.79 ⁸⁶
	449	146	311	112	295	117	72	129
19.7	46.002	10.29	50.477	60.49	22.122	23.91	43.98	28.08
Mar. 1.7	46.428 ⁴²⁶	12.03 ¹⁷⁴	50.771 ²⁹⁴	61.83 ¹³⁴	22.400 ²⁷⁸	23.07 ⁸⁴	44.67 ⁶⁹	29.78 ¹⁷⁰
11.7	46.822 ³⁹⁴	13.96 ¹⁹³	51.043 ²⁷²	63.04 ¹²¹	22.656 ²⁵⁶	22.57 ⁵⁰	45.31 ⁶⁴	31.80 ²⁰²
21.6	47.182 ³⁶⁰	16.02 ²⁰⁶	51.289 ²⁴⁶	64.13 ¹⁰⁹	22.889 ²³³	22.43 ¹¹	45.89 ⁵³	34.11 ²³¹
31.6	47.502 ³²⁰	18.21 ²¹⁹	51.508 ²¹⁹	65.08 ⁹⁵	23.094 ²⁰⁵	22.61 ¹⁸	46.42 ⁵⁸	36.65 ²⁵⁴
	276	225	192	80	179	47	15	272
Apr. 10.6	47.778	20.46	51.700	65.88	23.273	23.08	46.87	39.37
20.6	48.012 ²³¹	22.74 ²²⁸	51.862 ¹⁶²	66.53 ⁶⁵	23.422 ¹⁴⁹	23.80 ⁷²	47.24 ³⁷	42.21 ²⁸⁴
30.5	48.200 ¹⁸⁸	25.00 ²²⁶	51.995 ¹³³	67.05 ⁵²	23.543 ¹²¹	24.71 ⁹¹	47.54 ³⁰	45.12 ²³¹
May 10.5	48.339 ¹³⁹	27.21 ²¹⁰	52.098 ¹⁰³	67.45 ¹⁰	23.636 ⁹³	25.77 ¹⁰⁶	47.75 ²¹	48.03 ²⁹¹
20.5	48.432 ⁹³	29.31 ²¹⁰	52.171 ⁷³	67.73 ²⁸	23.699 ⁶³	26.93 ¹¹⁶	47.87 ¹²	50.87 ²⁸⁴
	40	198	44	19	33	120	4	272
30.4	48.472	31.29	52.215	67.92	23.732	28.13	47.91	53.59
June 9.4	48.462 ¹⁰	33.09 ¹⁸⁰	52.227 ¹²	68.01 ⁹	23.738 ⁶	29.33 ¹²⁰	47.85 ⁶	56.16 ²⁵⁷
19.4	48.404 ⁵⁸	34.66 ¹⁵⁷	52.207 ²⁰	68.02 ¹	23.714 ²¹	30.48 ¹¹⁵	47.71 ¹⁴	58.46 ²³⁰
29.4	48.298 ¹⁰⁶	36.01 ¹³⁵	52.159 ¹⁸	67.95 ⁷	23.663 ⁵¹	31.56 ¹⁰⁸	47.49 ²²	60.49 ²⁰³
July 9.3	48.147 ¹⁵¹	37.05 ¹⁰⁴	52.081 ⁷⁸	67.79 ¹⁶	23.584 ⁷⁹	32.55 ⁹⁹	47.19 ³⁰	62.14 ¹⁶⁵
	193	72	104	26	101	86	37	130
19.3	47.954	37.77	51.977	67.53	23.483	33.41	46.82	63.44
29.3	47.727 ²²⁷	38.16 ³⁹	51.848 ¹²⁹	67.21 ³²	23.358 ¹²⁵	34.12 ⁷¹	46.39 ¹³	64.25 ⁸¹
Aug. 8.3	47.473 ²⁵¹	38.17 ¹	51.702 ¹¹⁶	66.81 ⁴⁰	23.218 ¹¹⁰	34.68 ⁵⁶	45.92 ⁴⁷	64.63 ³⁸
18.2	47.203 ²⁷⁰	37.84 ³³	51.542 ¹⁶⁰	66.35 ⁴⁶	23.065 ¹³³	35.07 ³⁹	45.43 ⁴⁹	64.51 ¹²
28.2	46.928 ²⁷⁵	37.12 ⁷²	51.376 ¹⁶⁶	65.82 ⁵³	22.907 ¹⁵⁸	35.27 ²⁰	44.93 ⁵⁰	63.91 ⁶⁰
	269	105	161	57	157	2	49	107
Sept. 7.2	46.659	36.07	51.215	65.25	22.750	35.29	44.44	62.84
17.1	46.412 ²¹⁷	34.71 ¹³⁶	51.063 ¹⁵²	64.67 ⁵⁸	22.602 ¹⁴⁸	35.08 ²¹	43.99 ⁴⁵	61.33 ¹⁵¹
27.1	46.199 ²¹³	33.11 ¹⁶⁰	50.932 ¹³¹	64.11 ⁵⁰	22.472 ¹³⁰	34.67 ⁴¹	43.60 ³⁹	59.44 ¹⁸⁹
Oct. 7.1	46.033 ¹⁶⁶	31.31 ¹⁸⁰	50.831 ¹⁰¹	63.60 ⁵¹	22.369 ¹⁰³	34.02 ⁶⁵	43.28 ³²	57.23 ²²¹
17.1	45.927 ¹⁰⁶	29.38 ¹⁹³	50.768 ⁶³	63.18 ⁴²	22.301 ⁶⁸	33.14 ⁸⁸	43.06 ²²	54.77 ²⁴⁶
	39	197	18	27	28	113	11	260
27.0	45.888	27.41	50.750	62.91	22.273	32.01	42.95	52.17
Nov. 6.0	45.923 ³⁵	25.48 ¹⁹³	50.782 ³²	62.79 ¹²	22.292 ¹⁹	30.65 ¹³⁶	42.97 ²	49.55 ²⁶²
16.0	46.037 ¹¹⁴	23.69 ¹⁷⁹	50.868 ⁸⁶	62.88 ⁹	22.359 ⁶⁷	29.05 ¹⁶⁰	43.10 ¹³	46.99 ²⁵⁶
26.0	46.229 ¹⁹²	22.11 ¹⁵⁸	51.006 ¹³⁸	63.21 ³³	22.477 ¹¹⁸	27.25 ¹⁸⁰	43.37 ²⁷	44.62 ²³⁷
Dec. 5.9	46.493 ²⁶⁴	20.83 ⁹⁶	51.196 ¹⁹⁰	63.77 ⁵⁶	22.643 ¹⁶⁶	25.29 ¹⁹⁶	43.74 ³⁷	42.49 ²¹³
	329	128	233	81	210	210	49	174
15.9	46.822	19.87	51.429	64.58	22.853	23.19	44.23	40.75
25.9	47.205 ³⁸³	19.31 ⁵⁶	51.701 ²⁷²	65.59 ¹⁰¹	23.099 ²⁴⁰	21.05 ²¹⁴	44.81 ⁵⁸	39.41 ¹³⁴
35.8	47.631 ⁴²⁶	19.14 ¹⁷	52.001 ³⁰⁰	66.79 ¹²⁰	23.374 ²⁷⁵	18.92 ²¹³	45.46 ⁶⁵	38.53 ⁸⁸
Mean Place	44.585	25.62	49.683	65.06	21.589	27.58	41.719	48.13
Sec δ, Tan δ	1.617	-1.271	1.061	-0.354	1.004	+0.091	2.716	-2.525
Dψα, Dωα	+0.086	-0.058	+0.068	-0.016	+0.059	+0.004	+0.111	-0.113
Dψδ, Dωδ	-0.27	-0.73	-0.27	-0.73	-0.27	-0.74	-0.27	-0.74

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Boötis. Mag. 3.5		β Libræ. Mag. 2.7		γ Ursæ Minoris. Mag. 3.1		μ Boötis <i>pr.</i> Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 12 s	° ' " +33 35 "	h m 15 12 s	° ' " - 9 5 "	h m 15 20 s	° ' " +72 6 "	h m 15 21 s	° ' " +37 38 "
Jan. 0.9	22.548	62.08	50.766	50.35	46.20	21.29	33.386	44.60
10.8	22.857	59.43	51.062	51.98	46.81	18.60	33.696	41.85
20.8	23.189	57.17	51.372	53.60	47.51	16.44	34.033	39.52
30.8	23.530	55.33	51.686	55.15	48.26	14.89	34.384	37.62
Feb. 9.7	23.872	54.01	51.997	56.62	49.03	14.01	34.735	36.28
19.7	24.204	53.25	52.297	57.94	49.81	13.79	35.082	35.51
Mar. 1.7	24.520	53.04	52.582	59.07	50.56	14.26	35.412	35.32
11.7	24.811	53.40	52.844	59.99	51.26	15.38	35.720	35.74
21.6	25.075	54.28	53.082	60.67	51.88	17.09	36.000	36.70
31.6	25.303	55.61	53.297	61.14	52.42	19.31	36.244	38.15
Apr. 10.6	25.496	57.36	53.482	61.40	52.85	21.94	36.451	40.00
20.6	25.655	59.42	53.640	61.46	53.17	24.89	36.619	42.18
30.5	25.772	61.71	53.769	61.36	53.36	28.05	36.750	44.63
May 10.5	25.853	64.13	53.871	61.12	53.44	31.28	36.838	47.22
20.5	25.894	66.61	53.943	60.79	53.39	34.48	36.885	49.86
30.4	25.898	69.04	53.987	60.36	53.23	37.54	36.893	52.46
June 9.4	25.869	71.35	54.000	59.89	52.97	40.38	36.864	54.94
19.4	25.804	73.49	53.984	59.38	52.60	42.92	36.794	57.22
29.4	25.709	75.36	53.939	58.88	52.14	45.11	36.694	59.28
July 9.3	25.582	76.99	53.865	58.34	51.61	46.85	36.556	61.02
19.3	25.430	78.25	53.769	57.81	51.02	48.08	36.392	62.40
29.3	25.254	79.16	53.647	57.31	50.38	48.82	36.205	63.39
Aug. 8.3	25.062	79.69	53.508	56.83	49.70	49.04	35.998	63.95
18.2	24.858	79.81	53.355	56.37	49.01	48.75	35.777	64.15
28.2	24.650	79.52	53.199	55.97	48.32	47.92	35.550	63.92
Sept. 7.2	24.446	78.86	53.041	55.62	47.64	46.57	35.328	63.21
17.1	24.251	77.76	52.895	55.37	47.00	44.75	35.113	62.10
27.1	24.080	76.30	52.768	55.22	46.41	42.44	34.921	60.57
Oct. 7.1	23.938	74.42	52.666	55.22	45.90	39.74	34.757	58.65
17.1	23.835	72.20	52.603	55.37	45.47	36.65	34.633	56.36
27.0	23.772	69.73	52.577	55.65	45.15	33.27	34.551	53.73
Nov. 6.0	23.765	66.92	52.602	56.19	44.94	29.64	34.526	50.81
16.0	23.812	63.91	52.675	56.93	44.86	25.86	34.555	47.69
26.0	23.915	60.77	52.802	57.88	44.91	22.03	34.645	44.42
Dec. 5.9	24.074	57.55	52.977	59.04	45.10	18.23	34.793	41.07
15.9	24.283	54.36	53.192	60.38	45.42	14.60	34.994	37.75
25.9	24.539	51.29	53.446	61.88	45.87	11.22	35.245	34.56
35.8	24.830	48.40	53.728	63.46	46.43	8.21	35.535	31.59
Mean Place	23.922	64.47	51.646	59.08	50.387	28.60	34.894	47.28
Sec δ , Tan δ	1.201	+0.664	1.013	-0.160	3.255	+3.098	1.263	+0.771
$D\psi\alpha$, $D\omega\alpha$	+0.048	+0.030	+0.064	-0.007	-0.002	+0.132	+0.045	+0.033
$D\psi\delta$, $D\omega\delta$	-0.27	-0.74	-0.27	-0.75	-0.25	-0.77	-0.25	-0.77

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^1 Serpentis. Mag. 5.5		ι Draconis. Mag. 3.5		32 Libræ. Mag. 5.9		β Coronæ Borealis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 22	° ' +15 41	h m 15 23	° ' +59 13	h m 15 23	° ' -16 26	h m 15 24	° ' +29 21
	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	11.887	54.49	10.508	61.03	53.723	45.89	37.930	72.32
10.8	12.170 ²⁸³	52.15 ²³⁴	10.920 ⁴¹²	58.19 ²⁸⁴	54.022 ²⁹⁰	47.19 ¹³⁰	38.223 ²⁹³	69.68 ²⁶⁴
20.8	12.471 ³⁰¹	50.03 ²¹²	11.375 ⁴⁵⁵	55.87 ²³²	54.336 ³¹⁴	48.57 ¹³⁸	38.538 ³¹⁵	67.39 ²²⁹
30.8	12.781 ³¹⁰	48.19 ¹⁸⁴	11.861 ⁴⁸⁶	54.10 ¹⁷⁷	54.658 ³²²	49.97 ¹⁴⁰	38.866 ³²⁸	65.48 ¹⁹¹
Feb. 9.8	13.091 ³¹⁰	46.71 ¹⁴⁸	12.358 ⁴⁹⁷	52.99 ¹¹¹	54.978 ³²⁰	51.35 ¹³⁸	39.193 ³²⁷	64.03 ¹⁴⁵
19.7	13.391 ³⁰⁰	45.64 ¹⁰⁷	12.853 ⁴⁹⁵	52.54 ⁴⁵	55.289 ³¹¹	52.66 ¹³¹	39.517 ³²⁴	63.12 ⁹¹
Mar. 1.7	13.678 ²⁸⁷	45.00 ⁶¹	13.329 ⁴⁷⁶	52.76 ²²	55.584 ²⁹⁵	53.86 ¹²⁰	39.828 ³¹¹	62.75 ³⁷
11.7	13.944 ²⁶⁶	44.80 ²⁰	13.774 ⁴⁴⁵	53.64 ⁸⁸	55.860 ²⁷⁶	54.92 ¹⁰⁶	40.114 ²⁸⁶	62.91 ¹⁶
21.6	14.187 ²⁴³	45.02 ²²	14.174 ⁴⁰⁰	55.10 ¹⁴⁶	56.114 ²⁵⁴	55.84 ⁹²	40.375 ²⁶¹	63.58 ⁶⁷
31.6	14.403 ²¹⁶	45.64 ⁶²	14.521 ³⁴⁷	57.11 ²⁰¹	56.347 ²³³	56.58 ⁷⁴	40.607 ²³²	64.74 ¹¹⁶
Apr. 10.6	14.592 ¹⁸⁹	46.60 ⁹⁶	14.808 ²⁸⁷	57.11 ²⁴⁵	56.347 ¹⁹⁸	56.58 ⁵⁸	40.607 ¹⁹⁹	64.74 ¹⁵⁵
20.6	14.749 ¹⁵⁷	47.86 ¹²⁶	15.030 ²²²	59.56 ²⁷⁷	56.545 ¹⁷⁴	57.16 ⁴²	40.806 ¹⁶⁶	66.29 ¹⁸⁶
30.5	14.876 ¹²⁷	49.34 ¹⁴⁸	15.183 ¹⁵³	62.33 ²⁷⁷	56.719 ¹⁷⁴	57.58 ³⁰	40.972 ¹³⁰	68.15 ²¹¹
May 10.5	14.975 ⁹⁹	50.98 ¹⁶⁴	15.183 ⁸⁵	65.35 ³⁰²	56.866 ¹¹⁷	57.88 ¹⁷	41.102 ⁹⁶	70.26 ²²⁶
20.5	14.975 ⁶⁶	50.98 ¹⁷²	15.268 ¹⁶	68.47 ³¹²	56.983 ¹¹⁷	58.05 ⁷	41.198 ⁵⁷	72.52 ²³⁵
30.5	15.041 ³⁵	52.70 ¹⁷⁵	15.284 ⁵⁰	71.61 ³¹⁴	57.071 ⁸⁸	58.12 ¹	41.255 ²³	74.87 ²³⁵
June 9.4	15.076 ⁶	54.45 ¹⁷¹	15.234 ¹¹³	74.66 ²⁸⁵	57.129 ²⁷	58.11 ⁸	41.278 ¹¹	77.22 ²²³
19.4	15.082 ²⁶	56.16 ¹⁶¹	15.121 ¹⁷³	77.51 ²⁵⁹	57.156 ⁵	58.03 ¹⁵	41.267 ⁴⁶	79.45 ²¹⁰
29.4	15.056 ⁵⁴	57.77 ¹⁴⁹	14.948 ²²⁵	80.10 ²²¹	57.151 ³⁶	57.88 ²⁰	41.221 ⁷⁸	81.55 ¹⁹⁰
July 9.3	15.002 ⁸⁴	59.26 ¹³¹	14.723 ²⁷⁴	82.34 ¹⁸⁴	57.115 ⁶⁸	57.68 ²⁵	41.143 ¹⁰⁹	83.45 ¹⁶⁵
19.3	14.918 ¹¹⁰	60.57 ¹¹⁰	14.449 ³¹³	84.18 ¹⁴⁰	57.047 ⁹⁵	57.43 ²⁹	41.034 ¹³⁷	85.10 ¹³²
Aug. 8.3	14.808 ¹³¹	61.67 ⁸⁸	14.136 ³⁴⁸	85.58 ⁹³	56.952 ¹²¹	57.14 ³⁴	40.897 ¹⁶⁰	86.42 ¹⁰⁰
18.2	14.677 ¹⁵¹	62.55 ⁶³	13.788 ³⁷¹	86.51 ⁴³	56.831 ¹⁴²	56.80 ³⁸	40.737 ¹⁷⁸	87.42 ⁶⁵
28.2	14.526 ¹⁶⁵	63.18 ³⁶	13.417 ³⁸⁶	86.94 ⁹	56.689 ¹⁵⁶	56.42 ⁴²	40.559 ¹⁹²	88.07 ²⁸
Sept. 7.2	14.361 ¹⁷⁰	63.54 ⁹	13.031 ³⁹⁰	86.85 ⁶³	56.533 ¹⁶⁵	56.00 ⁴⁵	40.367 ¹⁹⁹	88.35 ¹¹
17.2	14.191 ¹⁷¹	63.63 ²¹	12.641 ³⁸⁵	86.22 ¹⁰⁷	56.368 ¹⁶⁴	55.55 ⁴⁵	40.168 ²⁰⁰	88.24 ⁴⁷
Oct. 7.1	14.020 ¹⁶²	63.42 ⁴⁸	12.256 ³⁸⁴	85.15 ¹⁵⁹	56.204 ¹⁵⁶	55.10 ⁴⁵	39.968 ¹⁸⁸	87.77 ⁸⁷
17.1	13.858 ¹⁴⁶	62.94 ⁷⁹	11.892 ³³⁴	83.56 ²⁰⁶	56.048 ¹³⁸	54.65 ⁴⁰	39.780 ¹⁷¹	86.90 ¹²⁶
Nov. 6.0	13.712 ¹¹⁹	62.15 ¹⁰⁸	11.558 ²⁹¹	81.50 ²⁴⁸	55.910 ¹¹²	54.25 ³⁴	39.609 ¹⁴⁴	85.64 ¹⁶⁰
16.0	13.593 ⁸⁷	61.07 ¹³⁶	11.267 ²³⁶	79.02 ²⁸⁹	55.798 ⁷⁶	53.91 ²⁴	39.465 ¹⁰⁹	84.04 ¹⁹⁵
26.0	13.506 ⁴⁵	59.71 ¹⁶⁶	11.031 ¹⁷¹	76.13 ³²¹	55.722 ³³	53.67 ¹⁰	39.356 ⁶⁸	82.09 ²²⁸
Dec. 5.9	13.461 ³	58.05 ¹⁹¹	10.860 ⁹⁷	72.92 ³⁴⁸	55.689 ¹⁵	53.57 ⁶	39.288 ¹⁷	79.81 ²⁵⁶
15.9	13.458 ⁵²	56.14 ²¹⁵	10.763 ¹⁵	69.44 ³⁶⁸	55.704 ⁶⁶	53.63 ²⁵	39.271 ³⁵	77.25 ²⁸¹
25.9	13.510 ¹⁰¹	53.99 ²³⁴	10.748 ⁶⁹	65.76 ³⁷⁶	55.770 ¹¹⁹	53.88 ⁴⁸	39.306 ⁹²	74.44 ²⁹⁸
35.9	13.611 ¹⁵¹	51.65 ²⁴⁸	10.817 ¹⁵⁶	62.00 ³⁷⁷	55.889 ¹⁷²	54.36 ⁶⁹	39.398 ¹⁴⁴	71.46 ³⁰⁵
Mean Place	13.762 ¹⁹⁷	49.17 ²⁵⁵	10.973 ²³⁴	58.23 ³⁶⁶	56.061 ²¹⁶	55.05 ⁸⁹	39.542 ¹⁹⁴	68.41 ³⁰⁸
Sec δ , Tan δ	13.004	52.14	12.997	66.99	54.630	56.75	39.266	73.09
$D\psi\alpha$, $D\omega\alpha$	1.039	+0.281	1.955	+1.680	1.043	-0.295	1.148	+0.563
$D\psi\delta$, $D\omega\delta$	+0.055	+0.012	+0.027	+0.071	+0.067	-0.012	+0.050	+0.024
	-0.25	-0.77	-0.25	-0.77	-0.25	-0.78	-0.25	-0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ^1 Boötis. Mag. 5.2		γ Lupi (mean). Mag. 3.0		γ Libræ. Mag. 4.0		α Coronæ Borealis. Mag. 2.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 28	° ' +41 5	h m 15 29	° ' -40 54	h m 15 31	° ' -14 31	h m 15 31	° ' +26 58
	s "	"	s "	"	s "	"	s "	"
Jan. 0.9	8.185	38.33	59.171	16.88	12.022	50.62	24.311	22.64
10.8	8.499 ³¹⁴	35.52 ²⁸¹	59.535 ³⁶⁴	17.12 ²¹	12.316 ²⁹⁴	51.96 ¹³⁴	24.598 ²⁸⁷	20.00 ²⁶⁴
20.8	8.843 ³¹¹	33.10 ²¹²	59.920 ³⁸⁵	17.67 ⁵⁵	12.626 ³¹⁰	53.35 ¹³⁹	24.906 ³⁰⁸	17.70 ²³⁰
30.8	9.202 ³⁵⁹	31.18 ¹⁹²	60.315 ³⁹⁵	18.49 ⁸²	12.944 ³¹⁸	54.75 ¹⁴⁰	25.224 ³¹⁸	15.78 ¹⁹²
Feb. 9.8	9.567 ³⁶⁵	29.79 ¹³⁹	60.708 ³⁹³	19.53 ¹⁰⁴	13.260 ³¹⁶	56.11 ¹³⁶	25.548 ³²⁴	14.27 ¹⁵¹
	361	74	385	124	310	128	320	98
19.7	9.928	29.00	61.093	20.77	13.570	57.39	25.868	13.29
Mar. 1.7	10.273 ³¹⁵	28.83 ¹⁷	61.463 ³⁷⁰	22.17 ¹⁴⁰	13.865 ²⁹⁵	58.52 ¹¹³	26.173 ³⁰⁵	12.83 ⁴⁶
11.7	10.597 ³²¹	29.27 ⁴¹	61.810 ³⁴⁷	23.68 ¹⁵¹	14.141 ²⁷⁶	59.50 ⁹⁸	26.459 ²⁸⁶	12.86 ³
21.7	10.891 ²⁹⁴	30.27 ¹⁰⁰	62.130 ³²⁰	25.27 ¹⁵⁹	14.398 ²⁵⁷	60.32 ⁸²	26.723 ²⁶⁴	13.44 ⁵⁸
31.6	11.151 ²⁶⁰	31.78 ¹⁵¹	62.422 ²⁹²	26.90 ¹⁶³	14.630 ²³²	60.95 ⁶³	26.957 ²³⁴	14.47 ¹⁰³
	220	195	260	165	207	45	202	142
Apr. 10.6	11.371	33.73	62.682	28.55	14.837	61.40	27.159	15.89
20.6	11.553 ¹⁸²	36.02 ²²⁹	62.907 ²²⁵	30.20 ¹⁶⁵	15.016 ¹⁷⁹	61.71 ³¹	27.331 ¹⁷²	17.63 ¹⁷⁴
30.5	11.693 ¹¹⁰	38.58 ²⁵⁶	63.098 ¹⁹¹	31.81 ¹⁶¹	15.168 ¹⁵²	61.88 ¹⁷	27.469 ¹³⁸	19.63 ²⁰⁰
May 10.5	11.788 ⁹⁵	41.27 ²⁶⁹	63.251 ¹⁵³	33.38 ¹⁵⁷	15.292 ¹²⁴	61.92 ⁴	27.572 ¹⁰³	21.81 ²¹⁸
20.5	11.840 ⁵²	44.03 ²⁷⁶	63.364 ¹¹³	34.87 ¹⁴⁹	15.385 ⁹³	61.86 ⁶	27.639 ⁶⁷	24.07 ²²⁶
	10	273	74	140	65	15	33	226
30.5	11.850	46.76	63.438	36.27	15.450	61.71	27.672	26.33
June 9.4	11.819 ³¹	49.38 ²⁶²	63.471 ³³	37.54 ¹²⁷	15.482 ³²	61.51 ²⁰	27.672 ⁰	28.51 ²¹⁸
19.4	11.746 ⁷³	51.78 ²¹⁰	63.461 ¹⁰	38.67 ¹¹³	15.482 ⁰	61.26 ²⁵	27.636 ³⁶	30.60 ²⁰⁹
29.4	11.637 ¹⁰⁹	53.93 ²¹⁵	63.409 ⁵²	39.63 ⁹⁶	15.451 ³¹	60.97 ²⁹	27.570 ⁶⁶	32.46 ¹⁸⁶
July 9.4	11.493 ¹⁴¹	55.75 ¹⁸²	63.318 ⁹¹	40.38 ⁷⁵	15.389 ⁶²	60.66 ³¹	27.471 ⁹⁹	34.09 ¹⁶³
	175	117	129	54	90	38	127	134
19.3	11.318	57.22	63.189	40.92	15.299	60.30	27.344	35.43
29.3	11.117 ²⁰¹	58.27 ¹⁰⁵	63.027 ¹⁶²	41.22 ³⁰	15.182 ¹¹⁷	59.93 ³⁷	27.195 ¹⁴⁹	36.47 ¹⁰⁴
Aug. 8.3	10.895 ²²²	58.91 ⁶⁴	62.837 ¹⁹⁰	41.26 ⁴	15.044 ¹³⁸	59.55 ³⁸	27.023 ¹⁷²	37.15 ⁶⁸
18.2	10.658 ²³⁷	59.10 ¹⁹	62.627 ²¹⁰	41.05 ²¹	14.889 ¹⁵⁵	59.14 ⁴¹	26.835 ¹⁸⁸	37.52 ³⁷
28.2	10.415 ²⁴³	58.86 ²⁴	62.408 ²¹⁹	40.56 ⁴⁹	14.726 ¹⁶³	58.74 ⁴⁰	26.641 ¹⁹⁴	37.48 ⁴
	243	70	221	75	166	41	194	36
Sept. 7.2	10.172	58.16	62.187	39.81	14.560	58.33	26.447	37.12
17.2	9.941 ²³¹	57.00 ¹¹⁶	61.979 ²⁰⁸	38.86 ⁹⁵	14.401 ¹⁵⁹	57.96 ³⁷	26.263 ¹⁸⁴	36.36 ⁷⁶
27.1	9.729 ²¹²	55.43 ¹⁵⁷	61.793 ¹⁸⁶	37.70 ¹¹⁶	14.259 ¹⁴²	57.62 ³⁴	26.091 ¹⁷²	35.23 ¹¹³
Oct. 7.1	9.549 ¹⁸⁰	53.45 ¹⁹⁸	61.639 ¹⁵⁴	36.40 ¹³⁰	14.144 ¹¹⁵	57.38 ²⁴	25.947 ¹⁴⁴	33.75 ¹⁴⁸
17.1	9.405 ¹¹⁴	51.08 ²³⁷	61.533 ¹⁰⁶	35.02 ¹³⁸	14.063 ⁸¹	57.24 ¹⁴	25.837 ¹¹⁰	31.90 ¹⁸⁵
	96	270	52	140	40	0	70	213
27.1	9.309 ⁴²	48.38 ³⁰⁰	61.481 ⁷	33.62 ¹³⁵	14.023 ⁷	57.24 ¹⁷	25.767 ²¹	29.77 ²⁴⁵
Nov. 6.0	9.267 ¹⁷	45.38 ³²²	61.488 ⁷⁸	32.27 ¹²³	14.030 ⁶⁰	57.41 ³⁶	25.746 ³⁰	27.32 ²⁶⁷
16.0	9.284 ⁷⁸	42.16 ³³⁹	61.561 ¹³⁹	31.04 ¹⁰³	14.090 ¹¹⁰	57.77 ⁵⁷	25.776 ⁸⁶	24.65 ²⁸⁴
26.0	9.362 ¹⁴⁰	38.77 ³⁴⁵	61.700 ²⁰¹	30.01 ⁸²	14.200 ¹⁶³	58.34 ⁷⁸	25.862 ¹³⁷	21.81 ²⁹⁷
Dec. 5.9	9.502 ¹⁹⁶	35.32 ³⁴¹	61.901 ²⁵⁸	29.19 ⁵⁴	14.363 ²⁰⁸	59.12 ⁹⁸	25.999 ¹⁸⁶	18.84 ³⁰⁰
15.9	9.698	31.91	62.159	28.65	14.571	60.10	26.185	15.84
25.9	9.947 ²⁴⁹	28.62 ³²⁹	62.466 ³⁰⁷	28.41 ²⁴	14.818 ²⁴⁷	61.25 ¹¹⁵	26.419 ²³⁴	12.89 ²⁹⁵
35.9	10.240 ²⁹³	25.59 ³⁰³	62.813 ³⁴⁷	28.50 ⁹	15.096 ²⁷⁸	62.55 ¹³⁰	26.685 ²⁶⁶	10.10 ²⁷⁹
Mean Place	9.814	41.24	60.161	33.62	12.974	61.05	25.629	22.53
Sec δ , Tan δ	1.327	+0.872	1.323	-0.866	1.033	-0.259	1.122	+0.509
$D\psi\alpha$, $D\omega\alpha$	+0.043	+0.036	+0.079	-0.035	+0.067	-0.010	+0.050	+0.020
$D\psi\delta$, $D\omega\delta$	-0.24	-0.79	-0.24	-0.79	-0.24	-0.80	-0.24	-0.80

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Cor. Bor. seq. Mag. 5.1		α Serpentis. Mag. 2.8		β Serpentis. Mag. 3.7		κ Serpentis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 36	° ' " +36 52	h m 15 40	° ' " + 6 39	h m 15 42	° ' " +15 39	h m 15 45	° ' " +18 22
	s	"	s	"	s	"	s	"
Jan. 0.9	27.166	64.49	27.319	66.12	36.831	45.60	15.124	44.66
10.9	27.465	61.69	27.592	64.03	37.101	43.24	15.393	42.22
20.8	27.789	59.24	27.881	62.10	37.392	41.07	15.686	39.98
30.8	28.131	57.25	28.182	60.35	37.697	39.18	15.990	38.06
Feb. 9.8	28.479	55.77	28.485	58.85	38.004	37.61	16.299	36.50
19.7	28.824	54.87	28.784	57.65	38.306	36.51	16.604	35.37
Mar. 1.7	29.156	54.55	29.073	56.81	38.598	35.79	16.899	34.69
11.7	29.469	54.81	29.343	56.35	38.873	35.53	17.177	34.49
21.7	29.755	55.63	29.593	56.24	39.128	35.70	17.436	34.72
31.6	30.011	56.94	29.819	56.48	39.358	36.29	17.670	35.41
Apr. 10.6	30.231	58.74	30.024	57.04	39.563	37.22	17.878	36.45
20.6	30.416	60.87	30.199	57.84	39.741	38.47	18.058	37.81
30.6	30.562	63.27	30.348	58.88	39.888	39.95	18.208	39.43
May 10.5	30.667	65.84	30.464	60.09	40.005	41.61	18.326	41.22
20.5	30.732	68.48	30.554	61.39	40.093	43.38	18.414	43.13
30.5	30.757	71.11	30.613	62.74	40.146	45.18	18.467	45.07
June 9.4	30.743	73.65	30.642	64.09	40.170	46.96	18.490	46.97
19.4	30.692	76.02	30.641	65.41	40.161	48.66	18.478	48.79
29.4	30.604	78.16	30.607	66.63	40.121	50.24	18.437	50.47
July 9.4	30.481	79.99	30.543	67.75	40.048	51.66	18.361	51.98
19.3	30.328	81.51	30.453	68.74	39.949	52.86	18.258	53.26
29.3	30.147	82.64	30.335	69.56	39.822	53.84	18.128	54.29
Aug. 8.3	29.943	83.38	30.196	70.20	39.675	54.56	17.978	55.04
18.3	29.726	83.70	30.043	70.65	39.511	55.03	17.809	55.50
28.2	29.498	83.60	29.878	70.92	39.337	55.21	17.630	55.68
Sept. 7.2	29.271	83.05	29.711	70.98	39.159	55.11	17.448	55.56
17.2	29.051	82.08	29.549	70.82	38.987	54.72	17.271	55.10
27.1	28.849	80.70	29.401	70.40	38.829	54.01	17.107	54.33
Oct. 7.1	28.675	78.90	29.279	69.73	38.694	53.03	16.966	53.24
17.1	28.536	76.74	29.185	68.86	38.590	51.73	16.857	51.85
27.1	28.441	74.24	29.127	67.71	38.526	50.16	16.787	50.14
Nov. 6.0	28.396	71.42	29.118	66.32	38.504	48.30	16.760	48.16
16.0	28.408	68.37	29.155	64.72	38.533	46.21	16.784	45.93
26.0	28.479	65.16	29.244	62.89	38.614	43.91	16.859	43.50
Dec. 6.0	28.607	61.84	29.382	60.90	38.744	41.45	16.985	40.92
15.9	28.791	58.53	29.563	58.79	38.920	38.92	17.159	38.28
25.9	29.026	55.30	29.788	56.65	39.141	36.37	17.375	35.61
35.9	29.302	52.28	30.042	54.49	39.393	33.89	17.628	33.03
Mean Place	28.710	66.12	28.422	60.90	38.026	42.43	16.362	42.00
Sec δ , Tan δ	1.250	+0.750	1.007	+0.117	1.039	+0.280	1.054	+0.332
$D\psi_a$, $D\omega_a$	+0.045	+0.029	+0.059	+0.004	+0.055	+0.011	+0.054	+0.012
$D\psi_\delta$, $D\omega_\delta$	-0.23	-0.81	-0.23	-0.82	-0.22	-0.83	-0.22	-0.83

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	12 H. Draconis. Mag. 5.1		μ Serpentis. Mag. 3.6		ζ Ursæ Minoris. Mag. 4.3		ϵ Serpentis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 45 s	° ' " +62 49 "	h m 15 45 s	° ' " - 3 11 "	h m 15 46 s	° ' " +78 1 "	h m 15 46 s	° ' " + 4 42 "
Jan. 0.9	26.41	69.04	34.921	36.40	40.07	49.96	57.447	37.13
10.9	26.82	66.05	35.194	38.13	40.84	47.11	57.714	35.12
20.8	27.29	63.52	35.486	39.81	41.75	44.75	58.002	33.22
30.8	27.80	61.55	35.788	41.39	42.76	42.98	58.300	31.49
Feb. 9.8	28.35	60.21	36.092	42.81	43.85	41.82	58.603	30.02
19.7	28.89	59.53	36.391	44.00	44.96	41.34	58.901	28.84
Mar. 1.7	29.42	59.54	36.680	44.97	46.06	41.54	59.190	27.97
11.7	29.92	60.21	36.953	45.65	47.11	42.38	59.462	27.47
21.7	30.39	61.51	37.207	46.06	48.08	43.87	59.715	27.30
31.6	30.80	63.38	37.439	46.21	48.92	45.88	59.946	27.45
Apr. 10.6	31.16	65.72	37.648	46.09	49.63	48.34	60.155	27.93
20.6	31.44	68.45	37.831	45.77	50.17	51.19	60.335	28.66
30.6	31.64	71.46	37.987	45.25	50.54	54.27	60.490	29.59
May 10.5	31.77	74.62	38.117	44.59	50.72	57.47	60.616	30.68
20.5	31.81	77.83	38.216	43.83	50.73	60.70	60.711	31.90
30.5	31.79	81.00	38.287	43.00	50.55	63.85	60.779	33.17
June 9.4	31.69	84.00	38.326	42.15	50.20	66.82	60.814	34.44
19.4	31.52	86.78	38.335	41.31	49.69	69.49	60.819	35.68
29.4	31.28	89.23	38.313	40.48	49.04	71.85	60.791	36.85
July 9.4	30.99	91.31	38.258	39.73	48.26	73.82	60.732	37.92
19.3	30.64	92.96	38.173	39.02	47.37	75.34	60.648	38.88
29.3	30.24	94.12	38.064	38.40	46.40	76.37	60.534	39.67
Aug. 8.3	29.82	94.81	37.931	37.86	45.37	76.88	60.398	40.31
18.3	29.37	94.98	37.781	37.41	44.29	76.89	60.246	40.79
28.2	28.91	94.63	37.620	37.08	43.20	76.34	60.082	41.11
Sept. 7.2	28.46	93.76	37.454	36.87	42.13	75.31	59.915	41.20
17.2	28.02	92.39	37.292	36.80	41.09	73.76	59.752	41.08
27.1	27.62	90.53	37.145	36.87	40.11	71.76	59.602	40.76
Oct. 7.1	27.25	88.22	37.021	37.11	39.22	69.29	59.473	40.20
17.1	26.93	85.49	36.928	37.53	38.46	66.45	59.376	39.42
27.1	26.68	82.39	36.872	38.14	37.83	63.25	59.314	38.40
Nov. 6.0	26.51	78.99	36.863	38.96	37.36	59.79	59.301	37.12
16.0	26.43	75.36	36.901	39.99	37.07	56.14	59.334	35.64
26.0	26.44	71.60	36.990	41.23	36.97	52.37	59.417	33.96
Dec. 6.0	26.56	67.79	37.128	42.63	37.07	48.62	59.550	32.10
15.9	26.76	64.04	37.312	44.20	37.37	44.95	59.725	30.09
25.9	27.05	60.48	37.538	45.89	37.87	41.50	59.946	28.06
35.9	27.42	57.21	37.793	47.63	38.55	33.36	60.195	25.98
Mean Place	29.318	73.63	35.979	44.17	46.529	55.35	58.557	31.26
Sec δ , Tan δ	2.191	+1.949	1.002	-0.056	4.823	+4.718	1.003	+0.082
$D\psi\alpha$, $D\omega\alpha$	+0.018	+0.072	+0.062	-0.002	-0.043	+0.173	+0.059	+0.003
$D\psi\delta$, $D\omega\delta$	-0.22	-0.83	-0.22	-0.83	-0.22	-0.84	-0.22	-0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Triang. Aust. Mag. 3.0		λ Libræ. Mag. 5.1		γ Serpentis. Mag. 3.9		π Scorpii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 48 s	° ' -63 11 "	h m 15 48 s	° ' -19 56 "	h m 15 52 s	° ' +15 54 "	h m 15 54 s	° ' -25 53 "
Jan. 0.9	18.91	20.74	50.586	5.67	52.494	46.65	10.321	24.09
10.9	19.45	19.88	50.877	6.68	52.758	44.23	10.621	24.80
20.8	20.03	19.46	51.186	7.80	53.044	42.01	10.941	25.66
30.8	20.64	19.45	51.508	8.98	53.344	40.06	11.274	26.64
Feb. 9.8	21.26	19.88	51.831	10.17	53.651	38.46	11.611	27.70
19.7	21.87	20.69	52.150	11.32	53.953	37.26	11.944	28.80
Mar. 1.7	22.47	21.88	52.459	12.43	54.247	36.49	12.266	29.90
11.7	23.04	23.40	52.752	13.43	54.527	36.17	12.572	30.96
21.7	23.58	25.19	53.025	14.33	54.786	36.29	12.860	31.97
31.6	24.07	27.22	53.277	15.09	55.024	36.82	13.125	32.91
Apr. 10.6	24.51	29.46	53.505	15.72	55.237	37.72	13.368	33.77
20.6	24.90	31.86	53.707	16.24	55.424	38.94	13.583	34.55
30.6	25.23	34.34	53.880	16.64	55.581	40.40	13.771	35.24
May 10.5	25.49	36.91	54.027	16.95	55.708	42.06	13.929	35.87
20.5	25.68	39.46	54.141	17.16	55.805	43.82	14.055	36.43
30.5	25.80	41.97	54.227	17.31	55.870	45.63	14.149	36.93
June 9.4	25.85	44.37	54.277	17.39	55.901	47.43	14.207	37.35
19.4	25.82	46.64	54.294	17.41	55.901	49.15	14.229	37.71
29.4	25.72	48.67	54.275	17.39	55.867	50.73	14.215	37.99
July 9.4	25.55	50.45	54.224	17.32	55.802	52.16	14.165	38.18
19.3	25.31	51.90	54.140	17.19	55.708	53.38	14.079	38.29
29.3	25.01	52.99	54.027	17.00	55.585	54.39	13.962	38.29
Aug. 8.3	24.66	53.69	53.888	16.74	55.440	55.13	13.818	38.19
18.3	24.27	53.95	53.731	16.44	55.275	55.61	13.652	37.95
28.2	23.87	53.78	53.559	16.08	55.100	55.81	13.472	37.61
Sept. 7.2	23.46	53.15	53.385	15.67	54.920	55.71	13.286	37.17
17.2	23.07	52.11	53.214	15.23	54.743	55.33	13.105	36.65
27.1	22.71	50.68	53.057	14.79	54.580	54.63	12.938	36.05
Oct. 7.1	22.40	48.89	52.926	14.37	54.437	53.65	12.796	35.41
17.1	22.17	46.84	52.827	13.99	54.325	52.35	12.688	34.78
27.1	22.02	44.58	52.771	13.70	54.251	50.76	12.624	34.19
Nov. 6.0	21.96	42.24	52.763	13.54	54.221	48.92	12.610	33.69
16.0	22.01	39.89	52.805	13.53	54.240	46.81	12.650	33.32
26.0	22.16	37.62	52.902	13.72	54.309	44.50	12.747	33.12
Dec. 6.0	22.42	35.54	53.052	14.11	54.429	42.02	12.897	33.12
15.9	22.77	33.74	53.251	14.70	54.597	39.44	13.099	33.33
25.9	23.20	32.26	53.491	15.49	54.808	36.86	13.345	33.75
35.9	23.71	31.16	53.766	16.43	55.056	34.33	13.627	34.38
Mean Place	20.575	40.84	51.619	17.49	53.726	43.12	11.390	37.23
Sec δ , Tan δ	2.217	-1.979	1.064	-0.363	1.040	+0.285	1.112	-0.485
$D\psi\alpha$, $D\omega\alpha$	+0.105	-0.072	+0.069	-0.013	+0.055	+0.010	+0.072	-0.017
$D\psi\delta$, $D\omega\delta$	-0.22	-0.84	-0.22	-0.84	-0.21	-0.85	-0.21	-0.85

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Coronæ Borealis. Mag. 4.2		δ Scorpii. Mag. 2.5		θ Draconis. Mag. 4.1		β Scorpii. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 15 54	° ' s +27 5	h m 15 55	° ' s -22 24	h m 16 0	° ' s +58 46	h m 16 0	° ' s -19 35
Jan. 0.9	22.506	61.06	45.518	1.17	24.112	10.82	56.250	33.23
10.9	22.774	58.36	45.809	2.03	24.467	7.70	56.534	34.20
20.8	23.070	55.95	46.122	3.01	24.877	5.01	56.838	35.26
30.8	23.379	53.91	46.447	4.07	25.326	2.88	57.154	36.36
Feb. 9.8	23.700	52.27	46.776	5.18	25.800	1.33	57.476	37.49
19.8	24.020	51.15	47.100	6.27	26.284	0.43	57.796	38.57
Mar. 1.7	24.329	50.57	47.415	7.35	26.763	0.21	58.106	39.59
11.7	24.623	50.50	47.716	8.35	27.222	0.67	58.402	40.52
21.7	24.897	50.94	47.997	9.26	27.651	1.76	58.682	41.33
31.6	25.148	51.88	48.257	10.08	28.037	3.43	58.941	42.02
Apr. 10.6	25.368	53.24	48.495	10.79	28.372	5.61	59.180	42.57
20.6	25.563	54.96	48.706	11.39	28.648	8.19	59.391	43.01
30.6	25.722	56.95	48.891	11.89	28.863	11.11	59.576	43.35
May 10.5	25.848	59.15	49.045	12.31	29.011	14.21	59.732	43.61
20.5	25.939	61.44	49.169	12.66	29.092	17.42	59.860	43.77
30.5	25.993	63.77	49.264	12.95	29.104	20.60	59.955	43.87
June 9.5	26.015	66.08	49.321	13.17	29.051	23.67	60.017	43.92
19.4	25.997	68.26	49.343	13.35	28.933	26.54	60.044	43.92
29.4	25.947	70.27	49.330	13.44	28.755	29.15	60.035	43.88
July 9.4	25.862	72.05	49.283	13.47	28.521	31.41	59.992	43.80
19.3	25.744	73.56	49.199	13.44	28.239	33.25	59.916	43.68
29.3	25.600	74.76	49.088	13.33	27.913	34.66	59.809	43.50
Aug. 8.3	25.433	75.65	48.948	13.16	27.554	35.59	59.673	43.28
18.3	25.245	76.16	48.787	12.92	27.169	36.01	59.518	43.02
28.2	25.047	76.31	48.613	12.57	26.769	35.93	59.347	42.69
Sept. 7.2	24.844	76.10	48.434	12.18	26.366	35.33	59.170	42.32
17.2	24.643	75.51	48.259	11.71	25.971	34.23	58.997	41.97
27.2	24.458	74.55	48.097	11.23	25.598	32.63	58.835	41.56
Oct. 7.1	24.296	73.20	47.956	10.72	25.258	30.56	58.696	41.18
17.1	24.165	71.50	47.853	10.26	24.965	28.06	58.589	40.83
27.1	24.073	69.48	47.788	9.86	24.731	25.16	58.521	40.59
Nov. 6.0	24.025	67.13	47.775	9.56	24.567	21.93	58.502	40.43
16.0	24.031	64.53	47.810	9.38	24.479	18.43	58.531	40.45
26.0	24.087	61.72	47.902	9.40	24.474	14.76	58.618	40.64
Dec. 6.0	24.201	58.76	48.047	9.61	24.553	11.00	58.753	41.00
15.9	24.361	55.76	48.241	10.02	24.717	7.27	58.940	41.57
25.9	24.571	52.79	48.479	10.64	24.962	3.68	59.169	42.31
35.9	24.821	49.94	48.754	11.44	25.278	0.32	59.435	43.19
Mean Place	23.903	59.78	46.590	13.52	26.712	13.86	57.345	44.95
Sec δ , Tan δ	1.123	+0.512	1.082	-0.412	1.929	+1.649	1.061	-0.356
$D\psi\alpha$, $D\omega\alpha$	+0.050	+0.018	+0.071	-0.014	+0.023	+0.055	+0.069	-0.012
$D\psi\delta$, $D\omega\delta$	-0.21	-0.85	-0.21	-0.86	-0.20	-0.87	-0.20	-0.87

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Herculis. Mag. 5.3		Groombridge 2320. Mag. 5.4		ϕ Herculis. Mag. 4.3		δ^1 Apodis. Mag. 4.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 4	° ' +17 14	h m 16 6	° ' +68 0	h m 16 6	° ' +45 7	h m 16 8	° ' -78 29
	s	"	s	"	s	"	s	"
Jan. 0.9	34.582 ²⁵¹	66.91 ²⁴⁴	2.76 ⁴³	42.64 ³¹³	18.722 ²⁸⁸	69.05 ³⁰⁶	42.77 ¹⁰⁶	56.36 ¹⁶⁸
10.9	34.836 ²⁸¹	64.47 ²²⁴	3.19 ⁵²	39.51 ²⁶⁸	19.010 ³²⁵	65.99 ²⁶⁹	43.83 ¹¹⁷	54.68 ¹¹⁹
20.8	35.117 ²⁹⁶	62.23 ¹⁰⁵	3.71 ⁵⁸	36.83 ²¹⁴	19.335 ³⁵³	63.30 ²²⁴	45.00 ¹²⁶	53.49 ⁷¹
30.8	35.413 ³⁰³	60.28 ¹⁶¹	4.29 ⁶¹	34.69 ¹⁵²	19.690 ³⁷⁰	61.06 ¹⁶⁹	46.26 ¹³⁰	52.78 ²¹
Feb. 9.8	35.716 ³⁰³	58.67 ¹¹⁹	4.90 ⁶⁵	33.17 ⁸⁶	20.060 ³⁷⁶	59.37 ¹¹⁰	47.56 ¹³³	52.57 ²⁷
19.8	36.019 ²⁹⁶	57.48 ⁷⁷	5.55 ⁶⁴	32.31 ¹⁹	20.436 ³⁷²	58.27 ⁴⁶	48.89 ¹³²	52.84 ⁷⁷
Mar. 1.7	36.315 ²⁸⁴	56.71 ³⁰	6.19 ⁶¹	32.12 ⁵⁰	20.808 ³⁵⁶	57.81 ¹⁷	50.21 ¹²⁷	53.61 ¹²⁰
11.7	36.599 ²⁶⁶	56.41 ¹⁵	6.80 ⁵⁸	32.62 ¹¹⁵	21.164 ³³⁵	57.98 ⁷⁸	51.48 ¹²¹	54.81 ¹⁶⁰
21.7	36.865 ²⁴⁶	56.56 ⁵⁹	7.38 ⁵²	33.77 ¹⁷³	21.499 ³⁰⁵	58.76 ¹³⁴	52.69 ¹¹³	56.41 ¹⁹⁸
31.6	37.111 ²²²	57.15 ⁹⁷	7.90 ⁴⁶	35.50 ²²⁵	21.804 ²⁷⁰	60.10 ¹⁸⁵	53.82 ¹⁰³	58.39 ²³¹
Apr. 10.6	37.333 ¹⁹⁶	58.12 ¹³⁰	8.36 ³⁷	37.75 ²⁶⁵	22.074 ²³²	61.95 ²²⁷	54.85 ⁹⁰	60.70 ²⁵⁶
20.6	37.529 ¹⁶⁶	59.42 ¹⁵⁶	8.73 ²⁷	40.40 ²⁹⁷	22.306 ¹⁸⁹	64.22 ²⁵⁹	55.75 ⁷⁷	63.26 ²⁷⁹
30.6	37.695 ¹³⁹	60.98 ¹⁷⁷	9.00 ¹⁹	43.37 ³¹⁸	22.495 ¹⁴³	66.81 ²⁸⁰	56.52 ⁶¹	66.05 ²⁹⁵
May 10.5	37.834 ¹⁰⁶	62.75 ¹⁸⁹	9.19 ⁹	46.55 ³²⁵	22.638 ⁹⁶	69.61 ²⁹³	57.13 ⁴⁵	69.00 ³⁰³
20.5	37.940 ⁷⁴	64.64 ¹⁹⁴	9.28 ¹	49.80 ³²⁶	22.734 ⁴⁹	72.54 ²⁹⁶	57.58 ²⁸	72.03 ³⁰⁵
30.5	38.014 ⁴⁰	66.58 ¹⁹³	9.27 ¹⁰	53.06 ³¹³	22.783 ²	75.50 ²⁸⁹	57.86 ¹¹	75.08 ³⁰¹
June 9.5	38.054 ⁷	68.51 ¹⁸⁵	9.17 ²⁰	56.19 ²⁹¹	22.785 ⁴⁵	78.39 ²⁷³	57.97 ⁸	78.09 ²⁸⁸
19.4	38.061 ²⁶	70.36 ¹⁷³	8.97 ²⁸	59.10 ²⁶⁶	22.740 ⁹¹	81.12 ²⁴⁹	57.89 ²⁵	80.97 ²⁶⁹
29.4	38.035 ⁶¹	72.09 ¹⁵⁷	8.69 ³⁵	61.76 ²²⁸	22.649 ¹³³	83.61 ²²¹	57.64 ⁴²	83.66 ²¹³
July 9.4	37.974 ⁹¹	73.66 ¹³⁵	8.34 ⁴³	64.01 ¹⁸⁷	22.516 ¹⁷³	85.82 ¹⁸⁶	57.22 ⁵⁸	86.09 ²⁰⁹
19.3	37.883 ¹²²	75.01 ¹¹²	7.91 ¹⁸	65.91 ¹⁴⁰	22.313 ²⁰⁸	87.68 ¹⁴⁶	56.64 ⁷²	88.18 ¹⁶⁹
29.3	37.761 ¹¹⁴	76.13 ⁸⁶	7.43 ⁵³	67.31 ⁹³	22.135 ²³⁶	89.14 ¹⁰⁴	55.92 ⁸³	89.87 ¹²⁶
Aug. 8.3	37.617 ¹⁶⁵	76.99 ⁵⁷	6.90 ⁵⁶	68.24 ⁴⁰	21.899 ²⁶¹	90.18 ⁵⁹	55.09 ⁹³	91.13 ⁷⁷
18.3	37.452 ¹⁸⁰	77.56 ³⁰	6.34 ⁵⁸	68.64 ¹⁰	21.638 ²⁷⁴	90.77 ¹²	54.16 ⁹⁸	91.90 ²³
28.2	37.272 ¹⁸⁵	77.86 ¹	5.76 ⁵⁹	68.54 ⁶¹	21.364 ²⁸⁰	90.89 ³⁵	53.18 ⁹⁹	92.13 ³⁶
Sept. 7.2	37.087 ¹⁸³	77.85 ³²	5.17 ⁵⁷	67.90 ¹¹⁸	21.084 ²⁷⁶	90.54 ⁸³	52.19 ⁹⁷	91.77 ⁸⁰
17.2	36.904 ¹⁷³	77.53 ⁶⁴	4.60 ⁵⁵	66.72 ¹⁶¹	20.808 ²⁶¹	89.71 ¹²⁹	51.22 ⁹¹	90.97 ¹³⁵
27.2	36.731 ¹⁵²	76.89 ⁹⁶	4.05 ⁵⁰	65.08 ²¹⁴	20.547 ²³⁸	88.42 ¹⁷⁴	50.31 ⁸⁰	89.62 ¹⁸³
Oct. 7.1	36.579 ¹²³	75.93 ¹²⁶	3.55 ⁴⁴	62.94 ²⁵⁶	20.309 ²⁰¹	86.68 ²¹⁷	49.51 ⁶⁶	87.79 ²²⁶
17.1	36.456 ⁸⁷	74.67 ¹⁵⁶	3.11 ³⁶	60.38 ²⁹⁷	20.108 ¹⁵⁷	84.51 ²⁵⁷	48.85 ⁴⁹	85.53 ²⁵⁴
27.1	36.369 ⁴⁵	73.11 ¹⁸⁵	2.75 ²⁸	57.41 ³³⁰	19.951 ¹⁰¹	81.94 ²⁸⁹	48.36 ²⁹	82.99 ²⁷⁹
Nov. 6.0	36.324 ⁶	71.26 ²¹⁰	2.47 ¹⁷	54.11 ³⁵⁷	19.847 ⁴¹	79.05 ³¹⁹	48.07 ⁷	80.20 ²⁹⁰
16.0	36.330 ⁵⁵	69.16 ²³³	2.30 ⁶	50.54 ³⁷²	19.803 ¹⁹	75.86 ³³⁸	48.00 ¹⁶	77.30 ²⁹²
26.0	36.385 ¹⁰⁷	66.83 ²⁴⁸	2.24 ⁵	46.82 ³⁸¹	19.822 ⁸⁴	72.48 ³⁵³	48.16 ³⁸	74.38 ²⁷⁹
Dec. 6.0	36.492 ¹⁵⁶	64.35 ²⁵⁸	2.29 ¹⁷	43.01 ³⁷⁷	19.906 ¹⁵⁰	68.95 ³⁵⁵	48.54 ⁶⁰	71.59 ²⁵⁹
15.9	36.648 ¹⁹⁸	61.77 ²⁶¹	2.46 ²⁷	39.24 ³⁶²	20.056 ²⁰⁷	65.40 ³⁴⁵	49.14 ⁷⁹	69.00 ²³⁰
25.9	36.846 ²³⁷	59.16 ²⁵⁴	2.73 ³⁸	35.62 ³³⁸	20.263 ²⁶¹	61.95 ³²⁸	49.93 ⁹⁶	66.70 ¹⁹⁰
35.9	37.083	56.62	3.11	32.24	20.524	58.67	50.89	64.80
Mean Place	35.869	63.21	6.401	45.96	20.604	70.07	46.943	77.06
Sec δ , Tan δ	1.047	+0.310	2.671	+2.477	1.418	+1.005	5.017	-4.917
$D\psi\alpha$, $D\omega\alpha$	+0.054	+0.010	+0.003	+0.079	+0.038	+0.032	+0.176	-0.153
$D\psi\delta$, $D\omega\delta$	-0.19	-0.88	-0.19	-0.88	-0.19	-0.88	-0.19	-0.88

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 3.0		σ Cor. Bor. <i>seq.</i> Mag. 5.8		19 Ursæ Minoris. Mag. 5.5		γ^2 Normæ. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 10 s	° ' " - 3 29 "	h m 16 11 s	° ' " +34 3 "	h m 16 12 s	° ' " +76 4 "	h m 16 14 s	° ' " -49 57 "
Jan. 0.9	17.353	41.33	46.084	12.17	54.26	15.98	2.556	48.18
10.9	17.610 ²⁵⁷	42.96 ¹⁶³	46.342 ²⁵⁸	9.28 ²⁸⁹	54.85	12.90 ³⁰⁸	2.933 ³⁷⁷	47.60 ⁵⁸
20.8	17.887 ²⁷⁷	44.56 ¹⁶⁰	46.635 ²⁹³	6.68 ²⁶⁰	55.57 ⁷²	10.24 ²⁶⁶	3.347 ¹¹¹	47.33 ²⁷
30.8	18.182 ²⁹⁵	46.09 ¹⁵³	46.950 ³¹⁵	4.45 ²²³	56.41 ⁸⁴	8.11 ²¹³	3.781 ⁴³¹	47.38 ⁵
Feb. 9.8	18.480 ²⁹⁸	47.45 ¹³⁶	47.279 ³²⁹	2.72 ¹⁷³	57.32 ⁹¹	6.59 ¹⁵²	4.229 ⁴⁴⁸	47.72 ³¹
	300	115	332	120	95	87	448	63
19.8	18.780	48.60	47.611	1.52	58.27	5.72	4.677	48.35
Mar. 1.7	19.072 ²⁹²	49.49 ⁸⁹	47.939 ³²⁸	0.91 ⁶¹	59.23 ⁹⁶	5.54 ¹⁸	5.118 ⁴⁴¹	49.22 ⁸⁷
11.7	19.353 ²⁸¹	50.14 ⁶⁵	48.255 ³¹⁶	0.87 ⁴	60.17 ⁹⁴	6.02 ⁴⁸	5.546 ⁴²⁸	50.32 ¹¹⁰
21.7	19.620 ²⁶⁷	50.53 ³⁹	48.552 ²⁹⁷	1.37 ⁵⁰	61.05 ⁸⁸	7.16 ¹¹⁴	5.952 ⁴⁰⁶	51.61 ¹²⁹
31.7	19.867 ²¹⁷	50.64 ¹⁵	48.825 ²⁷³	2.40 ¹⁰³	61.85 ⁸⁰	8.87 ¹⁷¹	6.334 ³⁸²	53.05 ¹⁴⁴
	226	15	245	151	69	223	319	158
Apr. 10.6	20.093	50.49	49.070	3.91	62.54	11.10	6.683	51.63
20.6	20.299 ²⁰⁶	50.13 ³⁶	49.285 ²¹⁵	5.83 ¹⁹²	63.10 ⁵⁶	13.75 ²⁶⁵	7.000 ³¹⁷	53.32 ¹⁶⁹
30.6	20.475 ¹⁷⁶	49.58 ⁵⁵	49.467 ¹⁸²	8.04 ²²¹	63.51 ⁴¹	16.71 ²⁹⁶	7.277 ²⁷⁷	58.08 ¹⁷⁶
May 10.5	20.630 ¹⁵⁵	48.88 ⁷⁰	49.611 ¹⁴¹	10.50 ²⁴⁶	63.78 ¹¹	19.88 ³¹⁷	7.515 ²³⁸	59.88 ¹⁸⁰
20.5	20.752 ¹²²	48.08 ⁸⁰	49.716 ¹⁰⁵	13.10 ²⁶⁰	63.89 ²⁷	23.12 ³²⁴	7.707 ¹⁹²	61.71 ¹⁸³
	95	86	68	264	4	325	143	181
30.5	20.847 ⁶⁰	47.22 ⁸⁹	49.784 ²⁷	15.74 ²⁶⁰	63.85 ²⁰	26.37 ³¹²	7.850 ⁹¹	63.52 ¹⁷⁵
June 9.5	20.907 ³⁰	46.33 ⁸⁸	49.811 ¹⁰	18.34 ²⁵⁰	63.65 ³¹	29.49 ²⁹¹	7.941 ³⁹	65.27 ¹⁶⁶
19.4	20.937 ⁵	45.45 ⁸¹	49.801 ⁵¹	20.84 ²³⁰	63.31 ¹⁸	32.40 ²⁶³	7.980 ¹⁶	66.93 ¹⁵⁵
29.4	20.932 ³⁸	44.61 ⁸⁰	49.747 ⁸⁷	23.14 ²⁰⁷	62.83 ⁵⁹	35.03 ²²⁸	7.964 ⁷¹	68.48 ¹²⁵
July 9.4	20.894 ⁷¹	43.81 ⁷³	49.660 ¹²⁷	25.21 ¹⁷⁵	62.24 ⁷¹	37.31 ¹⁸⁷	7.893 ¹²²	69.83 ¹¹⁵
19.4	20.823	43.08	49.533	26.96 ¹⁴³	61.53 ⁷⁹	39.18 ¹¹¹	7.771 ¹⁶⁹	70.98 ⁹⁰
29.3	20.723 ¹⁰⁰	42.45 ⁶³	49.371 ¹⁵⁹	28.39 ¹⁰⁸	60.74 ⁸⁶	40.59 ⁹³	7.602 ²⁰⁹	71.88 ⁶¹
Aug. 8.3	20.596 ¹²⁷	41.89 ⁵⁶	49.190 ¹⁸¹	29.47 ⁶⁵	59.88 ⁹²	41.52 ⁴²	7.393 ²¹³	72.49 ³²
18.3	20.449 ¹¹⁷	41.46 ⁴³	48.983 ²⁰⁷	30.12 ²⁴	58.96 ⁹¹	41.94 ¹⁰	7.150 ²⁶⁷	72.81 ⁴
28.2	20.287 ¹⁶²	41.11 ³⁵	48.759 ²²⁴	30.36 ¹⁴	58.02 ⁹⁵	41.84 ⁶³	6.883 ²⁷⁸	72.77 ³⁵
	170	20	229					
Sept. 7.2	20.117	40.91	48.530	30.22	57.07	41.21	6.605	72.42
17.2	19.948 ¹⁶⁹	40.83 ⁸	48.305 ²²⁵	29.61 ⁶¹	56.14 ⁹³	40.06 ¹¹⁵	6.330 ²⁷⁵	71.73 ⁶⁹
27.2	19.789 ¹⁵⁹	40.90 ⁷	48.088 ²¹⁷	28.61 ¹⁰⁰	55.24 ⁹⁰	38.43 ¹⁶³	6.073 ²⁵⁷	70.75 ⁹⁸
Oct. 7.1	19.650 ¹³⁹	41.11 ²¹	47.892 ¹⁹⁶	27.18 ¹⁴³	54.42 ⁸²	36.33 ²¹⁰	5.847 ²²⁶	69.50 ¹²⁵
17.1	19.537 ¹¹³	41.50 ³⁹	47.727 ¹⁶⁵	25.35 ¹⁸³	53.68 ⁷¹	33.80 ²⁵³	5.664 ¹⁸³	68.03 ¹⁴⁷
	73	59	124	217	63	293	125	164
27.1	19.464	42.09	47.603	23.18	53.05	30.87	5.539	66.39
Nov. 6.1	19.433 ³¹	42.85 ⁷⁶	47.522 ⁸¹	20.65 ²⁵³	52.55 ⁵⁰	27.62 ³²⁵	5.479 ⁶⁰	64.68 ¹⁷¹
16.0	19.445 ¹²	43.81 ⁹⁶	47.496 ²⁶	17.85 ²⁸⁰	52.20 ³⁵	24.10 ³⁵²	5.493 ¹⁴	62.96 ¹⁷²
26.0	19.512 ⁶⁷	44.98 ¹¹⁷	47.527 ³¹	14.82 ³⁰³	52.03 ¹⁷	20.42 ³⁶⁸	5.582 ⁸⁹	61.31 ¹⁶⁵
Dec. 6.0	19.624 ¹¹²	46.30 ¹³²	47.612 ⁸⁵	11.66 ³¹⁶	52.02 ¹⁶	16.65 ³⁷⁷	5.744 ²³¹	59.80 ¹⁵¹
	164	148	111	323		373	161	131
15.9	19.788	47.78	47.753	8.43	52.18	12.92	5.978	58.49
25.9	19.990 ²⁰²	49.39 ¹⁶¹	47.946 ¹⁹³	5.22 ³²¹	52.52 ³⁴	9.33 ³⁵⁹	6.276 ²⁹⁸	57.45 ¹⁰⁴
35.9	20.232 ²¹²	51.03 ¹⁶⁴	48.186 ²⁴⁰	2.15 ³⁰⁷	53.03 ⁵¹	6.00 ³³³	6.626 ³⁵⁰	56.68 ⁷⁷
Mean Place	18.507	49.54	47.664	11.21	59.965	19.04	4.037	65.39
Sec δ , Tan δ	1.002	-0.061	1.207	+0.676	4.155	+4.033	1.555	-1.190
$D\psi\alpha$, $D\omega\alpha$	+0.063	-0.002	+0.045	+0.021	-0.034	+0.121	+0.089	-0.035
$D\psi\delta$, $D\omega\delta$	-0.18	-0.89	-0.18	-0.89	-0.18	-0.89	-0.18	-0.90

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Ophiuchi. Mag. 3.3		σ Scorpii. Mag. 3.1		τ Herculis. Mag. 3.9		γ Herculis. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 14 s	° ' " - 4 30 "	h m 16 16 s	° ' " -25 24 "	h m 16 17 s	° ' " +46 29 "	h m 16 18 s	° ' " +19 19 "
Jan. 0.9	13.539 255	12.74 159	29.091 282	20.85 58	23.614 279	45.09 313	30.000 244	62.36 251
10.9	13.794 278	14.33 155	29.373 308	21.43 73	23.893 320	41.96 278	30.244 273	59.85 232
20.8	14.072 293	15.88 149	29.681 323	22.16 82	24.213 352	39.18 235	30.517 290	57.53 203
30.8	14.365 300	17.37 133	30.004 331	22.98 90	24.565 373	36.83 178	30.807 301	55.50 167
Feb. 9.8	14.665 300	18.70 112	30.335 331	23.88 93	24.938 381	35.05 118	31.108 304	53.83 124
19.8	14.965 293	19.82 92	30.666 325	24.81 92	25.319 381	33.87 58	31.412 300	52.59 81
Mar. 1.7	15.258 283	20.74 64	30.991 313	25.73 89	25.700 367	33.29 10	31.712 288	51.78 31
11.7	15.541 266	21.38 40	31.304 297	26.62 84	26.067 347	33.39 71	32.000 275	51.47 16
21.7	15.807 252	21.78 —	31.601 290	27.46 78	26.414 320	34.10 129	32.275 255	51.63 62
31.7	16.059 229	21.89 11	31.881 258	28.24 69	26.734 285	35.39 180	32.530 232	52.25 101
Apr. 10.6	16.288 209	21.78 32	32.139 235	28.93 63	27.019 248	37.19 221	32.762 208	53.26 137
20.6	16.497 182	21.46 52	32.374 207	29.56 56	27.267 207	39.43 258	32.970 181	54.63 166
30.6	16.679 155	20.94 66	32.581 181	30.12 51	27.474 158	42.01 283	33.151 150	56.29 188
May 10.5	16.834 129	20.28 76	32.762 119	30.63 45	27.632 111	44.84 298	33.301 118	58.17 201
20.5	16.963 97	19.52 82	32.911 116	31.08 41	27.743 61	47.82 301	33.419 87	60.18 206
30.5	17.060 67	18.70 85	33.027 81	31.49 37	27.804 14	50.83 296	33.506 50	62.24 208
June 9.5	17.127 34	17.85 84	33.108 15	31.86 32	27.818 39	53.79 281	33.556 17	64.32 199
19.4	17.161 0	17.01 82	33.153 6	32.18 27	27.779 86	56.60 261	33.573 20	66.31 187
29.4	17.161 34	16.19 76	33.159 33	32.45 21	27.693 127	59.21 283	33.553 53	68.18 169
July 9.4	17.127 68	15.43 70	33.126 70	32.66 14	27.566 174	61.54 198	33.500 87	69.87 150
19.4	17.059 97	14.73 61	33.056 104	32.80 7	27.392 211	63.52 158	33.413 118	71.37 123
29.3	16.962 125	14.12 53	32.952 135	32.87 2	27.181 212	65.10 116	33.295 115	72.60 97
Aug. 8.3	16.837 146	13.59 44	32.817 160	32.85 12	26.939 265	66.26 72	33.150 166	73.57 66
18.3	16.691 161	13.15 35	32.657 178	32.73 23	26.674 285	66.98 23	32.984 183	74.23 38
28.2	16.530 171	12.80 22	32.479 188	32.50 31	26.389 291	67.21 21	32.801 192	74.61 4
Sept. 7.2	16.359 171	12.58 10	32.291 188	32.19 41	26.098 290	67.00 74	32.609 192	74.65 28
17.2	16.188 161	12.48 3	32.103 178	31.78 48	25.808 279	66.26 122	32.417 181	74.37 63
27.2	16.027 142	12.51 18	31.925 155	31.30 53	25.529 253	65.04 165	32.236 165	73.74 95
Oct. 7.1	15.885 113	12.69 33	31.770 125	30.77 54	25.276 221	63.39 211	32.071 136	72.79 128
17.1	15.772 78	13.02 51	31.645 84	30.23 52	25.055 177	61.28 250	31.935 102	71.51 158
27.1	15.694 36	13.53 70	31.561 36	29.71 45	24.878 121	58.78 286	31.833 61	69.93 188
Nov. 6.1	15.658 12	14.23 89	31.525 16	29.26 36	24.757 66	55.92 317	31.772 10	68.05 215
16.0	15.670 62	15.12 108	31.541 72	28.90 20	24.691 2	52.75 340	31.762 39	65.90 237
26.0	15.732 113	16.20 127	31.613 127	28.70 5	24.693 68	49.35 353	31.801 91	63.53 255
Dec. 6.0	15.845 159	17.47 140	31.740 179	28.65 14	24.761 132	45.82 357	31.892 140	60.98 264
15.9	16.004 202	18.87 153	31.919 225	28.79 33	24.893 198	42.25 351	32.032 186	58.34 269
25.9	16.206 238	20.40 158	32.144 263	29.12 50	25.089 249	38.74 333	32.218 224	55.65 263
35.9	16.444	21.98	32.407	29.62	25.338	35.41	32.442	53.02
Mean Place	14.704	21.23	30.275	33.63	25.576	45.54	31.350	58.50
Sec δ , Tan δ	1.003	-0.079	1.107	-0.475	1.453	+1.054	1.060	+0.351
$D_{\psi\alpha}$, $D_{\omega\alpha}$	+0.063	-0.002	+0.072	-0.014	+0.036	+0.030	+0.053	+0.010
$D_{\psi\delta}$, $D_{\omega\delta}$	-0.18	-0.90	-0.17	-0.90	-0.17	-0.90	-0.17	-0.90

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Ursæ Minoris. Mag. 5.0		γ Apodis. Mag. 3.9		ω Herculis. Mag. 4.5		η Draconis. Mag. 2.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 19	° ' +75 55	h m 16 21	° ' -78 43	h m 16 21	° ' +14 12	h m 16 22	° ' +61 41
	s	"	s	"	s	"	s	"
Jan. 0.9	38.36	57.68	30.69	18.21	50.118	39.34	53.84	15.85
10.9	38.92	54.56	31.72	16.37	50.358	37.01	54.18	12.59
20.9	39.62	51.85	32.88	15.00	50.626	34.84	54.58	9.73
30.8	40.43	49.65	34.14	14.09	50.911	32.90	55.04	7.38
Feb. 9.8	41.32	48.04	35.46	13.68	51.206	31.28	55.53	5.60
19.8	42.26	47.10	36.81	13.75	51.505	30.04	56.05	4.44
Mar. 1.7	43.21	46.82	38.16	14.30	51.799	29.21	56.57	3.96
11.7	44.14	47.22	39.48	15.30	52.084	28.81	57.07	4.18
21.7	45.02	48.27	40.74	16.73	52.355	28.84	57.55	5.07
31.7	45.83	49.91	41.93	18.55	52.608	29.29	58.00	6.55
Apr. 10.6	46.52	52.08	43.02	20.67	52.839	30.12	58.39	8.57
20.6	47.09	54.69	43.99	23.11	53.047	31.28	58.72	11.03
30.6	47.53	57.61	44.82	25.76	53.231	32.70	58.99	13.87
May 10.6	47.82	60.76	45.50	28.61	53.384	34.34	59.18	16.94
20.5	47.96	64.01	46.33	31.58	53.508	36.10	59.31	20.16
30.5	47.94	67.27	46.38	34.59	53.602	37.93	59.36	23.43
June 9.5	47.76	70.44	46.54	37.59	53.660	39.77	59.33	26.61
19.4	47.45	73.40	46.52	40.51	53.685	41.56	59.23	29.63
29.4	47.00	76.09	46.32	43.26	53.675	43.24	59.06	32.45
July 9.4	46.43	78.45	45.94	45.78	53.632	44.77	58.82	34.91
19.4	45.74	80.40	45.40	47.98	53.555	46.13	58.52	37.01
29.3	44.97	81.91	44.70	49.83	53.446	47.26	58.18	38.67
Aug. 8.3	44.12	82.94	43.88	51.21	53.311	48.17	57.79	39.85
18.3	43.22	83.47	42.96	52.14	53.152	48.81	57.36	40.56
28.3	42.28	83.47	41.96	52.56	52.977	49.20	56.92	40.78
Sept. 7.2	41.34	82.96	40.94	52.43	52.794	49.30	56.46	40.44
17.2	40.41	81.93	39.94	51.76	52.609	49.13	56.01	39.59
27.2	39.51	80.41	38.98	50.55	52.432	48.65	55.57	38.23
Oct. 7.1	38.67	78.41	38.13	48.87	52.273	47.87	55.17	36.38
17.1	37.92	75.96	37.40	46.74	52.141	46.80	54.81	34.09
27.1	37.28	73.13	36.86	44.26	52.043	45.45	54.51	31.36
Nov. 6.1	36.76	69.94	36.50	41.53	51.987	43.81	54.28	28.25
16.0	36.39	66.48	36.37	38.67	51.978	41.92	54.12	24.85
26.0	36.18	62.84	36.47	35.76	52.019	39.80	54.06	21.22
Dec. 6.0	36.14	59.09	36.79	32.89	52.109	37.52	54.09	17.47
15.9	36.28	55.35	37.34	30.21	52.249	35.11	54.21	13.70
25.9	36.59	51.75	38.09	27.82	52.433	32.65	54.42	10.02
35.9	37.06	48.39	39.03	25.78	52.656	30.22	54.72	6.54
Mean Place	44.032	60.14	35.333	38.22	51.418	34.42	56.743	17.36
Sec δ , Tan δ	4.115	+3.992	5.116	-5.017	1.032	+0.253	2.109	+1.856
$D\psi\alpha$, $D\omega\alpha$	-0.035	+0.113	+0.182	-0.139	+0.055	+0.007	+0.016	+0.051
$D\psi\delta$, $D\omega\delta$	-0.17	-0.91	-0.17	-0.91	-0.17	-0.91	-0.16	-0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Scorpii. (Antares.) Mag. 1.2		β Herculis. Mag. 2.8		λ Ophiuchi. Mag. 3.8		Λ Draconis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 24 s	° ' " -26 15 "	h m 16 26 s	° ' " +21 39 "	h m 16 27 s	° ' " + 2 9 "	h m 16 28 s	° ' " +68 55 "
Jan. 0.9	39.738 ²⁸¹	31.79 ⁴⁹	53.097 ²³⁸	26.56 ²⁵⁹	0.470 ²³⁹	12.27 ¹⁸¹	3.70 ⁴⁰	63.62 ³²⁷
10.9	40.019 ³⁰⁴	32.28 ⁶²	53.335 ²⁶⁶	23.97 ²⁴⁰	0.709 ²⁶⁷	10.43 ¹⁷⁸	4.10 ⁴⁹	60.35 ²⁸⁷
20.9	40.323 ³¹⁹	32.90 ⁷⁵	53.601 ²⁸⁹	21.57 ²⁰⁹	0.976 ²⁸³	8.65 ¹⁶³	4.59 ⁵⁶	57.48 ²³⁵
30.8	40.642 ³³²	33.65 ⁸²	53.890 ³⁰⁰	19.48 ¹⁷⁴	1.259 ²⁹²	7.02 ¹⁴³	5.15 ⁶²	55.13 ¹⁸⁰
Feb. 9.8	40.974 ³³³	34.47 ⁸⁵	54.190 ³⁰⁵	17.74 ¹²⁹	1.551 ²⁹⁴	5.59 ¹¹⁷	5.77 ⁶⁵	53.33 ¹¹³
19.8	41.307 ³³⁰	35.32 ⁸⁵	54.495 ³⁰³	16.45 ⁸¹	1.845 ²⁹¹	4.42 ⁸⁸	6.42 ⁶⁷	52.20 ⁴⁷
Mar. 1.7	41.637 ³¹⁹	36.17 ⁸⁵	54.798 ²⁹³	15.64 ³²	2.136 ²⁸³	3.54 ⁵⁵	7.09 ⁶⁵	51.73 ²²
11.7	41.956 ³⁰³	37.02 ⁷⁷	55.091 ²⁷⁹	15.32 ¹⁸	2.419 ²⁷⁰	2.99 ²²	7.74 ⁶²	51.95 ⁹⁰
21.7	42.259 ²⁸⁷	37.79 ⁷⁵	55.370 ²⁶²	15.50 ⁶⁶	2.689 ²⁵²	2.77 ¹⁰	8.36 ⁵⁷	52.85 ¹⁵⁰
31.7	42.546 ²⁶⁵	38.54 ⁶⁸	55.632 ²³⁹	16.16 ¹⁰⁵	2.941 ²³⁵	2.87 ³⁸	8.93 ⁵¹	54.35 ²⁰³
Apr. 10.6	42.811 ²¹⁵	39.22 ⁶²	55.871 ²¹⁵	17.21 ¹⁴¹	3.176 ²¹²	3.25 ⁶⁶	9.44 ⁴³	56.38 ²⁵⁰
20.6	43.056 ²¹⁵	39.84 ⁵⁶	56.086 ¹⁹⁰	18.65 ¹⁷¹	3.388 ¹⁹⁰	3.91 ⁸⁷	9.87 ³⁴	58.88 ²⁸⁷
30.6	43.271 ¹⁹²	40.40 ⁵²	56.276 ¹⁵⁷	20.39 ¹⁹⁷	3.578 ¹⁶³	4.78 ¹⁰³	10.21 ²⁴	61.75 ³¹²
May 10.6	43.463 ¹⁵⁸	40.92 ⁴⁹	56.433 ¹²⁷	22.36 ²¹⁰	3.741 ¹³⁶	5.81 ¹¹⁶	10.45 ¹¹	64.87 ³²⁴
20.5	43.621 ¹²⁴	41.41 ⁴¹	56.560 ⁹²	24.46 ²²⁰	3.877 ¹⁰⁵	6.97 ¹²²	10.59 ⁴	68.11 ³²⁹
30.5	43.745 ⁹¹	41.85 ⁴⁰	56.652 ⁵⁸	26.66 ²¹⁸	3.982 ⁷³	8.19 ¹²¹	10.63 ⁶	71.40 ³²²
June 9.5	43.836 ⁵³	42.25 ³⁵	56.710 ²⁰	28.84 ²¹³	4.055 ⁴¹	9.43 ¹²⁴	10.57 ¹⁶	74.62 ³⁰⁶
19.4	43.889 ¹²	42.60 ³³	56.730 ¹⁸	30.97 ¹⁹⁹	4.096 ⁵	10.67 ¹¹⁵	10.41 ²⁵	77.68 ²⁸³
29.4	43.901 ²⁷	42.93 ²⁵	56.712 ⁴⁹	32.96 ¹⁸²	4.101 ²⁹	11.82 ¹⁰⁷	10.16 ³¹	80.51 ²⁵⁰
July 9.4	43.874 ⁶⁵	43.18 ¹⁹	56.663 ⁸⁶	34.78 ¹⁶⁰	4.072 ⁶²	12.89 ⁹⁷	9.82 ⁴¹	83.01 ²¹³
19.4	43.809 ¹⁰²	43.37 ¹⁴	56.577 ¹²¹	36.38 ¹³⁶	4.010 ⁹¹	13.86 ⁸³	9.41 ⁴⁹	85.14 ¹⁶⁸
29.3	43.707 ¹³¹	43.51 ²	56.456 ¹⁴³	37.74 ¹⁰⁴	3.916 ¹²²	14.69 ⁶⁸	8.92 ⁵⁴	86.82 ¹²¹
Aug. 8.3	43.576 ¹⁵⁸	43.53 ⁷	56.313 ¹⁷¹	38.78 ⁷³	3.794 ¹⁴⁶	15.37 ⁵³	8.38 ⁵⁸	88.03 ⁷³
18.3	43.418 ¹⁷⁸	43.46 ¹⁷	56.142 ¹⁸⁸	39.51 ⁴⁵	3.648 ¹⁶¹	15.90 ³⁷	7.80 ⁶¹	88.76 ²⁰
28.3	43.240 ¹⁹⁰	43.29 ²⁸	55.954 ¹⁹⁶	39.96 ⁷	3.484 ¹⁷³	16.27 ¹⁹	7.19 ⁶³	88.96 ³¹
Sept. 7.2	43.050 ¹⁹³	43.01 ³⁹	55.758 ¹⁹⁸	40.03 ²⁸	3.311 ¹⁷⁶	16.46 ¹	6.56 ⁶²	88.65 ⁸⁴
17.2	42.857 ¹⁸⁰	42.62 ⁴⁵	55.560 ¹⁹¹	39.75 ⁶²	3.135 ¹⁶⁷	16.47 ¹⁸	5.94 ⁶⁰	87.81 ¹³⁷
27.2	42.677 ¹⁶²	42.17 ⁵³	55.369 ¹⁷³	39.13 ⁹⁶	2.968 ¹⁵²	16.29 ³⁸	5.34 ⁵⁶	86.44 ¹⁸⁴
Oct. 7.1	42.515 ¹³¹	41.64 ⁵¹	55.196 ¹⁴⁸	38.17 ¹³³	2.816 ¹²⁵	15.91 ⁵⁹	4.78 ⁵⁰	84.60 ²³³
17.1	42.384 ⁹¹	41.13 ⁵¹	55.048 ¹¹²	36.84 ¹⁶²	2.691 ⁹²	15.32 ⁸¹	4.28 ⁴³	82.27 ²⁷³
27.1	42.293 ¹⁵	40.59 ⁵²	54.936 ⁷¹	35.22 ¹⁹⁵	2.599 ⁵¹	14.51 ¹⁰²	3.85 ³⁵	79.54 ³¹²
Nov. 6.1	42.248 ⁷	40.07 ³⁹	54.865 ²²	33.27 ²²⁵	2.548 ⁴	13.49 ¹²⁴	3.50 ²⁴	76.42 ³⁴¹
16.0	42.255 ⁶⁴	39.68 ²⁸	54.843 ²⁹	31.02 ²⁴⁶	2.544 ⁴⁵	12.25 ¹⁴¹	3.26 ¹³	73.01 ³⁶³
26.0	42.319 ¹¹⁸	39.40 ¹²	54.872 ⁷⁹	28.56 ²⁶⁰	2.589 ⁹⁶	10.81 ¹⁶³	3.13 ¹	69.38 ³⁷⁷
Dec. 6.0	42.437 ¹⁷²	39.28 ⁴	54.951 ¹³¹	25.96 ²⁷⁵	2.685 ¹⁴¹	9.18 ¹⁷⁶	3.12 ¹⁰	65.61 ³⁷⁸
16.0	42.609 ²¹⁸	39.32 ²⁴	55.082 ¹⁷⁶	23.21 ²⁷⁸	2.826 ¹⁸⁶	7.42 ¹⁸⁵	3.22 ²³	61.83 ³⁶⁹
25.9	42.827 ²⁶⁰	39.56 ⁴¹	55.258 ²¹⁹	20.43 ²⁷³	3.012 ²²³	5.57 ¹⁸⁹	3.45 ³³	58.14 ³⁴⁷
35.9	43.087	39.97	55.477	17.70	3.235	3.68	3.78	54.67
Mean Place	40.972	44.61	54.497	22.77	1.700	4.93	7.559	65.13
Sec δ , Tan δ	1.115	-0.493	1.076	+0.397	1.001	+0.038	2.782	+2.597
$D\psi\alpha$, $D\omega\alpha$	+0.073	-0.013	+0.051	+0.010	+0.060	+0.001	-0.002	+0.068
$D\psi\delta$, $D\omega\delta$	-0.16	-0.91	-0.16	-0.92	-0.16	-0.92	-0.16	-0.92

APPARENT PLACES OF STARS, 1923.

449

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Scorpii. Mag. 2.9		σ Herculis. Mag. 4.2		ζ Ophiuchi. Mag. 2.7		ϵ Scorpii. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 31 s	° ' -28 3	h m 16 31 s	° ' +42 35	h m 16 32 s	° ' -10 24	h m 16 37 s	° ' -17 35
Jan. 0.9	3.851	14.44	35.367	42.66	53.778	34.47	5.776	28.42
10.9	4.128 ²⁷⁷	14.79 ³⁵	35.621 ²⁵⁴	39.51 ³¹⁵	54.024 ²¹⁶	35.70 ¹²³	6.029 ²⁵³	29.27 ⁸⁵
20.9	4.433 ³⁰⁵	15.29 ⁵⁰	35.916 ²⁹⁵	36.69 ²⁸²	54.297 ²⁷³	36.97 ¹²⁷	6.308 ²⁷⁹	30.20 ⁹³
30.8	4.757 ³²⁴	15.91 ⁶²	36.241 ³²⁵	34.28 ²⁴¹	54.587 ²⁹⁰	38.18 ¹²¹	6.606 ²⁹⁸	31.16 ⁹⁶
Feb. 9.8	5.091 ³³⁴	16.63 ⁷²	36.589 ³⁴⁸	32.39 ¹⁸⁹	54.886 ²⁹⁹	39.33 ¹¹⁵	6.915 ³⁰⁹	32.10 ⁹⁴
19.8	5.427 ³³⁶	17.40 ⁷⁷	36.946 ³⁵⁷	31.04 ¹³⁵	55.189 ³⁰³	40.34 ¹⁰¹	7.226 ³¹¹	33.00 ⁹⁰
Mar. 1.7	5.760 ³³³	18.20 ⁸⁰	37.305 ³⁵⁹	30.31 ⁷³	55.489 ³⁰⁰	41.17 ⁸³	7.535 ³⁰⁹	33.81 ⁸¹
11.7	6.084 ³²⁴	19.00 ⁸⁰	37.656 ³⁵¹	30.22 ⁹	55.780 ²⁹¹	41.83 ⁶⁶	7.836 ³⁰¹	34.49 ⁶⁸
21.7	6.394 ³¹⁰	19.77 ⁷⁴	37.991 ³³⁵	30.73 ⁵¹	56.059 ²⁷⁹	42.28 ⁴⁵	8.126 ²⁷⁰	35.05 ⁵⁶
31.7	6.689 ²⁹⁵	20.51 ⁷⁷	38.303 ³¹²	31.83 ¹¹⁰	56.325 ²⁶⁶	42.54 ²⁶	8.402 ²⁹⁸	35.47 ⁴²
Apr. 10.6	6.964 ²⁷⁵	21.20 ⁶⁹	38.587 ²⁸⁴	33.46 ¹⁶³	56.571 ²⁴⁶	42.60 ⁶	8.659 ²⁵⁷	35.77 ³⁰
20.6	7.215 ²⁵¹	21.85 ⁶⁵	38.838 ²⁵¹	35.52 ²⁰⁶	56.799 ²²⁸	42.49 ¹¹	8.897 ²³⁸	35.93 ¹⁶
30.6	7.442 ²²⁷	22.47 ⁶²	39.052 ²¹⁴	37.96 ²¹⁴	57.001 ²⁰²	42.23 ²⁶	9.110 ²¹³	36.00 ⁷
May 10.6	7.641 ¹⁹⁹	23.05 ⁵⁸	39.224 ¹⁷²	40.65 ²⁶⁹	57.179 ¹⁷⁸	41.84 ³⁹	9.300 ¹⁹⁰	35.98 ²
20.5	7.808 ¹⁶⁷	23.60 ⁵⁵	39.353 ¹²⁹	43.53 ²⁸⁸	57.328 ¹⁴⁹	41.37 ⁴⁷	9.460 ¹⁶⁰	35.91 ⁷
30.5	7.943 ¹³⁵	24.12 ⁵²	39.436 ⁸³	46.47 ²⁹⁴	57.448 ¹²⁰	40.85 ⁵²	9.590 ¹³⁰	35.79 ¹²
June 9.5	8.041 ⁹⁸	24.62 ⁵⁰	39.473 ³⁷	49.39 ²⁹²	57.535 ⁸⁷	40.30 ⁵⁵	9.687 ⁹⁷	35.65 ¹¹
19.4	8.100 ⁵⁹	25.08 ⁴⁶	39.462 ¹¹	52.20 ²⁸¹	57.588 ⁵³	39.74 ⁵⁶	9.748 ⁶¹	35.50 ¹⁵
29.4	8.120 ²⁰	25.50 ⁴²	39.407 ⁵⁵	54.84 ²⁶⁴	57.605 ¹⁷	39.19 ⁵⁵	9.771 ²³	35.34 ¹⁶
July 9.4	8.098 ²²	25.86 ³⁶	39.306 ¹⁰¹	57.21 ²³⁷	57.585 ²⁰	38.67 ⁵²	9.757 ¹⁴	35.18 ¹⁶
19.4	8.037 ⁶¹	26.16 ³⁰	39.164 ¹⁴²	59.27 ²⁰⁶	57.532 ⁵³	38.19 ⁴⁸	9.707 ⁵⁰	35.02 ¹⁶
29.3	7.940 ⁹⁷	26.36 ²⁰	38.984 ¹⁸⁰	60.97 ¹⁷⁰	57.445 ⁸⁷	37.76 ⁴³	9.621 ⁸⁶	34.85 ¹⁷
Aug. 8.3	7.808 ¹³²	26.47 ¹¹	38.770 ²¹⁴	62.27 ¹³⁰	57.326 ¹¹⁹	37.37 ³⁹	9.502 ¹¹⁹	34.67 ¹⁸
18.3	7.647 ¹⁶¹	26.48 ¹	38.529 ²⁴¹	63.14 ⁸⁷	57.182 ¹⁴⁴	37.04 ³³	9.357 ¹¹⁵	34.48 ¹⁹
28.3	7.466 ¹⁸¹	26.36 ¹²	38.269 ²⁶⁰	63.57 ⁴³	57.023 ¹⁵⁹	36.73 ³¹	9.191 ¹⁶⁶	34.28 ²⁰
Sept. 7.2	7.273 ¹⁹³	26.11 ²⁵	37.997 ²⁷²	63.53 ⁴	56.850 ¹⁷³	36.50 ²³	9.012 ¹⁷⁹	34.05 ²³
17.2	7.076 ¹⁹⁷	25.75 ³⁶	37.725 ²⁷²	63.02 ⁵¹	56.673 ¹⁷⁷	36.32 ¹⁸	8.830 ¹⁸²	33.81 ²⁴
27.2	6.888 ¹⁸⁸	25.30 ⁴⁵	37.462 ²⁶³	62.04 ⁹⁸	56.505 ¹⁶⁸	36.22 ¹⁰	8.654 ¹⁷⁶	33.58 ²³
Oct. 7.1	6.720 ¹⁶⁸	24.76 ⁵⁴	37.219 ²⁴³	60.60 ¹⁴⁴	56.351 ¹⁵⁴	36.21 ¹	8.496 ¹⁵⁸	33.36 ²²
17.1	6.581 ¹³⁹	24.17 ⁵⁹	37.005 ²¹⁴	58.73 ¹⁸⁷	56.227 ¹²⁴	36.31 ¹⁰	8.364 ¹³²	33.18 ¹⁸
27.1	6.482 ⁹⁹	23.56 ⁶¹	36.831 ¹⁷⁴	56.44 ²²⁹	56.134 ⁹³	36.51 ²⁰	8.266 ⁹⁸	33.07 ¹¹
Nov. 6.1	6.431 ⁵¹	22.98 ⁵⁸	36.706 ¹²⁵	53.79 ²⁶⁵	56.085 ⁴⁹	36.87 ³⁶	8.212 ⁵⁴	33.05 ²
16.0	6.433 ²	22.47 ⁵¹	36.636 ⁷⁰	50.81 ²⁹⁸	56.080 ⁵	37.40 ⁵³	8.208 ⁴	33.15 ¹⁰
26.0	6.490 ⁵⁷	22.07 ⁴⁰	36.627 ⁹	47.59 ³²²	56.129 ⁴⁹	38.09 ⁶⁹	8.256 ⁴⁸	33.39 ²⁴
Dec. 6.0	6.604 ¹¹⁴	21.83 ²⁴	36.678 ⁵¹	44.20 ³³⁹	56.226 ⁹⁷	38.94 ⁸⁵	8.355 ⁹⁹	33.78 ³⁹
16.0	6.772 ¹⁶⁸	21.75 ⁸	36.792 ¹¹⁴	40.72 ³¹⁸	56.373 ¹⁴⁷	39.94 ¹⁰⁰	8.504 ¹⁴⁹	34.32 ⁵⁴
25.9	6.988 ²¹⁶	21.84 ⁹	36.964 ¹⁷²	37.28 ³⁴⁴	56.561 ¹⁸⁸	41.07 ¹¹³	8.699 ¹⁹⁵	35.02 ⁷⁰
35.9	7.245 ²⁵⁷	22.12 ²⁸	37.191 ²²⁷	33.97 ³³¹	56.792 ²³¹	42.30 ¹²³	8.932 ²³³	35.84 ⁸²
Mean Place	5.124	27.44	37.218	41.67	55.002	44.23	7.022	39.47
Sec δ , Tan δ	1.133	-0.533	1.358	+0.919	1.017	-0.184	1.049	-0.317
$D\psi\alpha$, $D\omega\alpha$	+0.074	-0.013	+0.039	+0.023	+0.066	-0.005	+0.069	-0.007
$D\psi\delta$, $D\omega\delta$	-0.15	-0.93	-0.15	-0.93	-0.15	-0.93	-0.14	-0.94

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ζ Herculis. Mag. 3.0		η Herculis. Mag. 3.6		α Triang. Aust. Mag. 1.9		Groombridge 2377. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 38 s	° ' " +31 44 "	h m 16 40 s	° ' " +39 3 "	h m 16 40 s	° ' " -68 52 "	h m 16 43 s	° ' " +56 54 "
Jan. 0.9	21.398	32.01	13.559	66.08	26.84	60.65	47.625	69.08
10.9	21.631 233	29.11 290	13.799 240	62.98 310	27.41 57	58.97 168	47.904 279	65.72 336
20.9	21.896 265	26.45 266	14.075 276	60.17 281	28.05 64	57.67 130	48.243 339	62.71 301
30.8	22.190 294	24.15 230	14.383 308	57.76 241	28.74 69	56.75 92	48.631 388	60.16 255
Feb. 9.8	22.501 311	22.27 188	14.714 331	55.79 197	29.48 74	56.24 51	49.055 424	58.13 203
	319	137	341	141	76	4	447	141
19.8	22.820	20.90	15.055	54.38	30.24	56.20	49.502	56.72
Mar. 1.8	23.140 320	20.07 83	15.400 345	53.56 82	31.00 76	56.55 35	49.959 457	55.97 75
11.7	23.455 315	19.82 25	15.738 338	53.35 21	31.75 75	57.25 70	50.412 453	55.89 8
21.7	23.756 301	20.12 30	16.063 325	53.72 37	32.48 73	58.37 112	50.849 437	56.45 56
31.7	24.039 283	20.97 85	16.367 304	54.70 98	33.16 68	59.79 142	51.257 408	57.67 122
	281	133	279	148	65	171	371	179
Apr. 10.6	24.300	22.30	16.646	56.18	33.81	61.53	51.628	59.46
20.6	24.535 235	24.06 176	16.897 251	58.11 193	34.40 59	63.52 199	51.954 326	61.72 226
30.6	24.739 204	26.16 210	17.116 219	60.41 230	34.92 52	65.73 221	52.228 274	64.37 265
May 10.6	24.908 169	28.53 237	17.293 177	62.98 257	35.36 41	68.13 240	52.444 216	67.34 297
20.5	25.043 135	31.07 254	17.430 137	65.75 277	35.73 37	70.64 251	52.598 154	70.49 315
	97	262	97	285	27	261	90	323
30.5	25.140	33.69	17.527	68.60	36.00	73.25	52.688	73.72
June 9.5	25.198 58	36.32 263	17.577 50	71.45 285	36.18 18	75.86 261	52.713 25	76.94 322
19.5	25.216 18	38.87 255	17.584 7	74.21 276	36.26 8	78.41 255	52.672 41	80.05 311
29.4	25.193 23	41.27 240	17.548 36	76.82 261	36.24 2	80.85 211	52.567 105	82.96 291
July 9.4	25.129 64	43.45 218	17.467 81	79.20 238	36.12 12	83.14 229	52.403 164	85.61 265
	101	194	120	208	22	203	222	229
19.4	25.028	45.39	17.347	81.28	35.90	85.17	52.181	87.90
29.3	24.891 137	47.02 163	17.187 160	83.00 172	35.59 31	86.88 171	51.910 271	89.82 192
Aug. 8.3	24.721 170	48.30 128	16.992 195	84.38 138	35.20 39	88.25 137	51.596 314	91.30 148
18.3	24.527 194	49.21 91	16.771 221	85.33 95	34.74 46	89.24 99	51.245 351	92.30 100
28.3	24.316 211	49.73 52	16.531 240	85.84 51	34.24 50	89.75 51	50.869 376	92.82 52
	226	13	253	10	52	1	392	1
Sept. 7.2	24.090	49.86	16.278	85.94	33.72	89.76	50.477	92.81
17.2	23.862 228	49.56 30	16.020 258	85.55 39	33.18 54	89.35 41	50.083 394	92.30 51
27.2	23.641 221	48.84 72	15.771 249	84.71 84	32.67 51	88.42 93	49.696 387	91.28 102
Oct. 7.2	23.434 207	47.70 114	15.539 232	83.45 126	32.20 47	87.06 136	49.334 362	89.77 151
17.1	23.255 179	46.17 153	15.332 207	81.73 172	31.80 40	85.29 177	49.005 329	87.77 200
	146	191	169	213	32	210	280	244
27.1	23.109	44.26	15.163	79.60	31.48	83.19	48.725	85.33
Nov. 6.1	23.007 102	41.99 227	15.042 121	77.11 249	31.28 20	80.86 233	48.505 220	82.48 285
16.0	22.954 53	39.42 257	14.971 71	74.28 283	31.19 9	78.36 250	48.352 153	79.28 320
26.0	22.955 1	36.60 282	14.959 12	71.18 310	31.23 4	75.81 255	48.275 77	75.82 346
Dec. 6.0	23.012 57	33.60 300	15.005 46	67.95 323	31.40 19	73.29 252	48.277 2	72.18 364
	113	313	105	337	27	239	84	372
16.0	23.125	30.47	15.110	64.58	31.69	70.90	48.361	68.46
25.9	23.287 162	27.34 313	15.271 161	61.21 337	32.10 41	68.74 216	48.523 162	64.77 369
35.9	23.496 209	24.29 305	15.483 212	57.94 327	32.61 51	66.87 187	48.760 237	61.24 353
Mean Place	22.987	29.24	15.320	64.15	29.723	78.81	50.173	68.61
Sec δ, Tan δ	1.176	+0.619	1.288	+0.812	2.776	-2.590	1.832	+1.535
D _ψ a, D _ω a	+0.046	+0.014	+0.041	+0.018	+0.126	-0.059	+0.023	+0.033
D _ψ δ, D _ω δ	-0.14	-0.94	-0.14	-0.94	-0.14	-0.94	-0.13	-0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Scorpii. Mag. 2.4		49 Herculis. Mag. 6.4		ϵ^1 Aræ. Mag. 4.2		κ Ophiuchi. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 45 s	° ' " -34 9	h m 16 48 s	° ' " +15 6	h m 16 53 s	° ' " -53 2	h m 16 53 s	° ' " + 9 29
Jan. 0.9	8.904	4.35	33.090	13.69	24.483	22.81	59.999	43.73
10.9	9.184	4.29	33.309	11.32	24.837	21.71	60.214	41.60
20.9	9.495	4.41	33.559	9.12	25.238	20.89	60.459	39.59
30.8	9.829	4.67	33.830	7.13	25.673	20.35	60.726	37.75
Feb. 9.8	10.177	5.11	34.116	5.44	26.130	20.12	61.008	36.18
19.8	10.530	5.65	34.410	4.13	26.600	20.17	61.298	34.94
Mar. 1.8	10.883	6.27	34.704	3.23	27.073	20.50	61.586	34.04
11.7	11.228	6.98	34.993	2.76	27.540	21.08	61.872	33.55
21.7	11.564	7.72	35.272	2.76	27.996	21.90	62.151	33.44
31.7	11.884	8.50	35.538	3.17	28.432	22.93	62.416	33.74
Apr. 10.7	12.183	9.30	35.787	4.00	28.844	24.15	62.666	34.39
20.6	12.461	10.11	36.015	5.16	29.228	25.54	62.895	35.34
30.6	12.715	10.92	36.221	6.62	29.575	27.08	63.106	36.57
May 10.6	12.939	11.75	36.398	8.31	29.882	28.74	63.287	38.00
20.5	13.130	12.58	36.548	10.16	30.144	30.49	63.443	39.60
30.5	13.285	13.42	36.664	12.09	30.355	32.31	63.566	41.26
June 9.5	13.403	14.24	36.748	14.05	30.512	34.14	63.658	42.95
19.5	13.478	15.04	36.795	15.97	30.609	35.96	63.716	44.63
29.4	13.510	15.81	36.807	17.79	30.646	37.72	63.737	46.22
July 9.4	13.497	16.50	36.782	19.48	30.621	39.36	63.722	47.71
19.4	13.440	17.11	36.721	21.00	30.536	40.85	63.670	49.04
29.4	13.342	17.63	36.626	22.29	30.391	42.13	63.583	50.18
Aug. 8.3	13.206	18.01	36.499	23.35	30.194	43.17	63.466	51.16
18.3	13.038	18.22	36.347	24.14	29.953	43.90	63.322	51.89
28.3	12.844	18.27	36.174	24.67	29.678	44.32	63.156	52.38
Sept. 7.2	12.635	18.13	35.986	24.90	29.381	44.39	62.976	52.63
17.2	12.422	17.84	35.795	24.83	29.075	44.10	62.790	52.64
27.2	12.213	17.36	35.609	24.46	28.776	43.46	62.608	52.41
Oct. 7.2	12.025	16.73	35.435	23.78	28.500	42.49	62.439	51.87
17.1	11.862	16.00	35.284	22.81	28.262	41.23	62.289	51.10
27.1	11.743	15.17	35.165	21.53	28.078	39.73	62.173	50.05
Nov. 6.1	11.672	14.33	35.085	19.97	27.956	38.05	62.095	48.75
16.1	11.656	13.49	35.049	18.12	27.909	36.26	62.058	47.21
26.0	11.697	12.74	35.062	16.07	27.938	34.44	62.072	45.43
Dec. 6.0	11.799	12.07	35.125	13.80	28.048	32.66	62.132	43.48
16.0	11.959	11.56	35.239	11.41	28.236	31.02	62.244	41.42
25.9	12.170	11.22	35.397	8.95	28.493	29.54	62.398	39.24
35.9	12.427	11.08	35.595	6.50	28.817	28.30	62.594	37.05
Mean Place	10.311	17.97	34.466	8.06	26.384	38.62	61.345	37.11
Sec δ , Tan δ	1.208	-0.678	1.036	+0.270	1.663	-1.329	1.014	+0.167
$D\psi\alpha$, $D\omega\alpha$	+0.078	-0.015	+0.054	+0.006	+0.095	-0.025	+0.057	+0.003
$D\psi\delta$, $D\omega\delta$	-0.13	-0.95	-0.12	-0.95	-0.11	-0.96	-0.11	-0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	30 Ophiuchi. Mag. 5.0		ε Herculis. Mag. 3.9		δ Herculis. Mag. 5.3		η Ophiuchi. Mag. 2.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 16 56 s " " "	° ' " - 4 6 " " "	h m 16 57 s " " "	° ' " +31 2 " " "	h m 16 58 s " " "	° ' " +33 40 " " "	h m 17 5 s " " "	° ' " -15 37 " " "
Jan. 0.9	58.676	21.03	18.972	23.78	44.036	47.26	56.231	40.51
10.9	58.897	22.50	19.187	20.85	44.249	44.25	56.459	41.32
20.9	59.146	23.94	19.436	18.13	44.498	41.47	56.716	42.19
30.8	59.417	25.30	19.716	15.75	44.782	39.04	56.994	43.07
Feb. 9.8	59.702	26.52	20.015	13.77	45.087	37.00	57.286	43.88
19.8	59.993	27.55	20.328	12.27	45.404	35.49	57.589	44.64
Mar. 1.8	60.286	28.35	20.645	11.30	45.728	34.52	57.893	45.30
11.7	60.575	28.90	20.959	10.91	46.050	34.12	58.195	45.80
21.7	60.855	29.20	21.264	11.07	46.363	34.28	58.489	46.18
31.7	61.124	29.21	21.555	11.78	46.661	35.03	58.774	46.41
Apr. 10.7	61.379	28.99	21.827	12.99	46.938	36.28	59.045	46.50
20.6	61.616	28.53	22.076	14.63	47.192	38.00	59.299	46.44
30.6	61.832	27.89	22.297	16.64	47.419	40.09	59.535	46.28
May 10.6	62.025	27.09	22.487	18.95	47.612	42.47	59.746	46.03
20.5	62.191	26.20	22.642	21.46	47.768	45.06	59.932	45.76
30.5	62.328	25.25	22.760	24.08	47.887	47.77	60.086	45.42
June 9.5	62.432	24.27	22.839	26.72	47.965	50.51	60.208	45.09
19.5	62.505	23.31	22.878	29.31	48.002	53.20	60.293	44.76
29.4	62.540	22.39	22.875	31.78	47.996	55.75	60.343	44.45
July 9.4	62.538	21.53	22.830	34.06	47.945	58.10	60.352	44.14
19.4	62.499	20.77	22.747	36.10	47.857	60.21	60.324	43.89
29.4	62.423	20.10	22.624	37.84	47.727	62.03	60.255	43.67
Aug. 8.3	62.317	19.53	22.468	39.25	47.563	63.50	60.153	43.47
18.3	62.182	19.07	22.283	40.33	47.368	64.58	60.018	43.30
28.3	62.025	18.72	22.075	41.00	47.153	65.28	59.862	43.13
Sept. 7.2	61.854	18.50	21.852	41.28	46.922	65.59	59.686	42.97
17.2	61.675	18.40	21.622	41.15	46.684	65.44	59.505	42.84
27.2	61.499	18.44	21.397	40.58	46.448	64.87	59.322	42.71
Oct. 7.2	61.335	18.60	21.183	39.62	46.227	63.87	59.153	42.61
17.1	61.194	18.92	20.994	38.25	46.027	62.45	59.006	42.55
27.1	61.084	19.40	20.837	36.49	45.861	60.62	58.889	42.57
Nov. 6.1	61.015	20.06	20.720	34.36	45.738	58.42	58.812	42.67
16.1	60.988	20.89	20.650	31.91	45.658	55.89	58.781	42.88
26.0	61.007	21.91	20.633	29.20	45.634	53.10	58.797	43.17
Dec. 6.0	61.076	23.08	20.669	26.27	45.667	50.06	58.867	43.62
16.0	61.194	24.40	20.760	23.21	45.752	46.91	58.984	44.19
25.9	61.357	25.82	20.902	20.10	45.892	43.71	59.150	44.89
35.9	61.559	27.30	21.091	17.05	46.079	40.57	59.357	45.70
Mean Place	59.978	29.75	20.574	19.92	45.690	43.62	57.577	50.88
Sec δ, Tan δ	1.003	-0.072	1.167	+0.602	1.202	+0.666	1.038	-0.280
Dψα, Dωα	+0.063	-0.001	+0.046	+0.011	+0.044	+0.012	+0.068	-0.004
Dψδ, Dωδ	-0.11	-0.96	-0.11	-0.96	-0.11	-0.96	-0.09	-0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	η Scorpii. Mag. 3.4		ζ Draconis. Mag. 3.2		α Herculis. Var. 3.1-3.9		δ Herculis. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 6 s	° ' -43 8 "	h m 17 8 s	° ' +65 48 "	h m 17 11 s	° ' +14 28 "	h m 17 11 s	° ' +24 55 "
Jan. 0.9	36.396	7.86	30.26	35.61	6.728	43.49	50.554	49.75
10.9	36.685	7.17	30.54	32.13	6.928	41.16	50.752	47.00
20.9	37.013	6.67	30.91	28.94	7.156	38.97	50.985	44.42
30.9	37.372	6.40	31.35	26.18	7.413	36.97	51.246	42.13
Feb. 9.8	37.751	6.32	31.85	23.93	7.689	35.29	51.528	40.18
19.8	38.141	6.43	32.40	22.27	7.976	33.94	51.823	38.66
Mar. 1.8	38.536	6.74	32.98	21.27	8.266	32.99	52.125	37.62
11.7	38.929	7.19	33.56	20.94	8.555	32.46	52.427	37.11
21.7	39.313	7.78	34.13	21.30	8.840	32.38	52.723	37.12
31.7	39.685	8.51	34.68	22.31	9.113	32.74	53.008	37.64
Apr. 10.7	40.039	9.34	35.18	23.92	9.373	33.51	53.278	38.63
20.6	40.372	10.28	35.63	26.06	9.614	34.63	53.528	40.05
30.6	40.677	11.31	36.01	28.64	9.837	36.05	53.756	41.84
May 10.6	40.953	12.43	36.32	31.56	10.033	37.71	53.956	43.89
20.6	41.193	13.63	36.54	34.73	10.202	39.56	54.125	46.17
30.5	41.393	14.87	36.68	38.04	10.342	41.51	54.260	48.56
June 9.5	41.549	16.14	36.72	41.37	10.444	43.49	54.358	51.00
19.5	41.657	17.42	36.68	44.64	10.513	45.44	54.418	53.41
29.4	41.715	18.67	36.55	47.75	10.546	47.33	54.438	55.73
July 9.4	41.721	19.86	36.34	50.61	10.538	49.09	54.419	57.89
19.4	41.675	20.97	36.04	53.18	10.495	50.67	54.358	59.85
29.4	41.578	21.94	35.68	55.37	10.414	52.05	54.261	61.54
Aug. 8.3	41.436	22.75	35.25	57.13	10.298	53.22	54.127	62.94
18.3	41.253	23.34	34.77	58.43	10.154	54.13	53.965	64.02
28.3	41.038	23.71	34.26	59.25	9.988	54.75	53.776	64.78
Sept. 7.3	40.802	23.82	33.71	59.56	9.803	55.10	53.572	65.17
17.2	40.555	23.67	33.16	59.34	9.610	55.14	53.360	65.17
27.2	40.310	23.26	32.60	58.59	9.419	54.92	53.147	64.81
Oct. 7.2	40.081	22.60	32.07	57.33	9.238	54.36	52.944	64.08
17.1	39.881	21.72	31.58	55.55	9.074	53.51	52.762	62.95
27.1	39.723	20.67	31.14	53.30	8.941	52.35	52.609	61.47
Nov. 6.1	39.617	19.47	30.77	50.63	8.844	50.93	52.494	59.64
16.1	39.571	18.21	30.48	47.56	8.787	49.20	52.423	57.50
26.0	39.588	16.94	30.29	44.19	8.781	47.23	52.401	55.09
Dec. 6.0	39.671	15.71	30.19	40.59	8.823	45.09	52.429	52.47
16.0	39.820	14.59	30.20	36.87	8.912	42.82	52.509	49.68
26.0	40.028	13.61	30.32	33.13	9.048	40.43	52.639	46.83
35.9	40.289	12.81	30.53	29.49	9.225	38.04	52.813	43.98
Mean Place	38.078	21.84	33.663	33.61	8.138	37.12	52.076	44.52
Sec δ , Tan δ	1.370	-0.937	2.441	+2.226	1.033	+0.258	1.103	+0.465
$D\psi\alpha$, $D\omega\alpha$	+0.085	-0.014	+0.004	+0.033	+0.054	+0.004	+0.049	+0.006
$D\psi\delta$, $D\omega\delta$	-0.09	-0.97	-0.09	-0.97	-0.08	-0.98	-0.08	-0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π Herculis. Mag. 3.4		θ Ophiuchi. Mag. 3.4		w Herculis. Mag. 5.4		β Aræ. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 12 s	° ' +36 53 "	h m 17 17 s	° ' -24 55 "	h m 17 17 s	° ' +32 33 "	h m 17 18 s	° ' -55 27 "
Jan. 0.9	20.107	46.32	15.267	15.39	44.976	61.65	51.500	16.97
10.9	20.310	43.20	15.499	15.60	45.169	58.62	51.837	15.52
20.9	20.551	40.33	15.762	15.94	45.402	55.79	52.229	14.32
30.9	20.829	37.76	16.049	16.34	45.667	53.26	52.661	13.40
Feb. 9.8	21.134	35.59	16.356	16.80	45.958	51.12	53.127	12.78
19.8	21.453	33.96	16.673	17.28	46.265	49.45	53.611	12.43
Mar. 1.8	21.783	32.89	16.994	17.72	46.580	48.32	54.106	12.38
11.8	22.115	32.41	17.314	18.14	46.898	47.76	54.603	12.60
21.7	22.440	32.50	17.630	18.50	47.213	47.77	55.093	13.08
31.7	22.753	33.19	17.936	18.83	47.515	48.35	55.569	13.83
Apr. 10.7	23.047	34.42	18.229	19.09	47.802	49.45	56.026	14.77
20.6	23.317	36.14	18.507	19.32	48.068	51.01	56.456	15.96
30.6	23.560	38.27	18.767	19.49	48.307	52.97	56.854	17.34
May 10.6	23.770	40.72	19.002	19.67	48.519	55.25	57.212	18.87
20.6	23.941	43.37	19.211	19.83	48.695	57.76	57.525	20.55
30.5	24.075	46.19	19.387	20.00	48.834	60.41	57.785	22.34
June 9.5	24.165	49.08	19.528	20.18	48.934	63.12	57.988	24.21
19.5	24.211	51.91	19.632	20.38	48.991	65.80	58.130	26.11
29.5	24.212	54.63	19.698	20.57	49.006	68.39	58.206	28.00
July 9.4	24.166	57.15	19.718	20.79	48.977	70.80	58.215	29.82
19.4	24.080	59.42	19.699	21.00	48.906	72.98	58.155	31.51
29.4	23.949	61.41	19.634	21.23	48.795	74.89	58.029	33.07
Aug. 8.3	23.782	63.06	19.534	21.39	48.646	76.48	57.844	34.36
18.3	23.582	64.31	19.396	21.52	48.464	77.68	57.607	35.40
28.3	23.356	65.15	19.233	21.56	48.256	78.53	57.327	36.09
Sept. 7.3	23.111	65.59	19.049	21.55	48.031	78.97	57.015	36.46
17.2	22.858	65.54	18.855	21.45	47.795	78.98	56.687	36.46
27.2	22.606	65.08	18.660	21.27	47.559	78.57	56.361	36.07
Oct. 7.2	22.366	64.17	18.477	21.03	47.334	77.73	56.051	35.33
17.2	22.147	62.80	18.313	20.72	47.127	76.46	55.773	34.23
27.1	21.960	61.01	18.184	20.41	46.952	74.80	55.545	32.86
Nov. 6.1	21.813	58.83	18.096	20.08	46.812	72.76	55.380	31.23
16.1	21.710	56.29	18.052	19.77	46.719	70.35	55.288	29.43
26.0	21.665	53.43	18.059	19.55	46.675	67.66	55.273	27.53
Dec. 6.0	21.674	50.38	18.123	19.40	46.687	64.73	55.343	25.62
16.0	21.741	47.16	18.237	19.36	46.753	61.63	55.494	23.75
26.0	21.863	43.87	18.404	19.46	46.871	58.48	55.724	22.02
35.9	22.037	40.63	18.609	19.65	47.040	55.35	56.023	20.45
Mean Place	21.847	42.27	16.713	26.73	46.625	56.91	53.716	31.53
Sec δ , Tan δ	1.250	+0.751	1.103	-0.465	1.187	+0.639	1.764	-1.453
$D\psi\alpha$, $D\omega\alpha$	+0.042	+0.010	+0.073	-0.006	+0.045	+0.008	+0.099	-0.017
$D\psi\delta$, $D\omega\delta$	-0.08	-0.98	-0.07	-0.98	-0.07	-0.98	-0.07	-0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Ophiuchi. Mag. 4.3		σ Ophiuchi. Mag. 4.4		δ Aræ. Mag. 3.8		α Aræ. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 21	° ' " -24 6	h m 17 22	° ' " + 4 12	h m 17 24	° ' " -60 36	h m 17 25	° ' " -49 48
	s	"	s	"	s	"	s	"
Jan. 0.9	38.463	10.52	40.234	30.18	5.89	64.01	51.166	47.06
10.9	38.687 ²²⁴	10.75 ²³	40.428 ¹⁹⁴	28.35 ¹⁸³	6.26 ³⁷	62.27 ¹⁷⁴	51.462 ²⁹⁶	45.84 ¹²²
20.9	38.946 ²⁵⁹	11.12 ³⁷	40.652 ²²⁴	26.59 ¹⁷⁶	6.69 ⁴³	60.79 ¹⁴⁸	51.806 ³⁴⁴	44.84 ¹⁰⁰
30.9	39.229 ²⁸³	11.53 ⁴¹	40.901 ²⁴⁹	24.98 ¹⁶¹	7.18 ⁴⁹	59.63 ¹¹⁶	52.185 ³⁷⁹	44.09 ⁷⁵
Feb. 9.8	39.531 ³⁰²	11.99 ⁴⁶	41.169 ²⁶⁸	23.55 ¹⁴³	7.70 ⁵²	58.76 ⁸⁷	52.595 ⁴¹⁰	43.57 ⁵²
	313	46	279	115	55	53	427	30
19.8	39.844	12.45	41.448	22.40	8.25	58.23	53.022	43.27
Mar. 1.8	40.160 ³¹⁶	12.86 ⁴¹	41.733 ²⁸⁵	21.54 ⁸⁶	8.81 ⁵⁶	58.00 ²³	53.460 ⁴³⁸	43.22 ⁵
11.8	40.479 ³¹⁹	13.26 ⁴⁰	42.020 ²⁸⁷	21.03 ⁵¹	9.38 ⁵⁷	58.12 ¹²	53.900 ⁴⁴⁰	43.40 ¹⁸
21.7	40.795 ³¹⁶	13.58 ³²	42.302 ²⁸²	20.86 ¹⁷	9.94 ⁵⁶	58.55 ⁴³	54.336 ⁴³⁶	43.76 ³⁶
31.7	41.101 ³⁰⁶	13.88 ³⁰	42.576 ²⁷⁴	21.03 ¹⁷	10.49 ⁵⁵	59.28 ⁷³	54.763 ⁴²⁷	44.35 ⁵⁹
	294	21	262	50	53	97	409	76
Apr. 10.7	41.395	14.09	42.838	21.53	11.02	60.25	55.172	45.11
20.6	41.675 ²⁸⁰	14.25 ¹⁶	43.086 ²¹⁸	22.32 ⁷⁹	11.52 ⁵⁰	61.52 ¹²⁷	55.560 ³⁸⁸	46.04 ⁹³
30.6	41.934 ²⁵⁹	14.37 ¹²	43.316 ²³⁰	23.36 ¹⁰⁴	11.97 ⁴⁵	63.00 ¹⁴⁸	55.922 ³⁶²	47.15 ¹¹¹
May 10.6	42.172 ²³⁸	14.48 ¹¹	43.524 ²⁰⁸	24.60 ¹²⁴	12.39 ⁴²	64.71 ¹⁷¹	56.251 ³²⁹	48.39 ¹²⁴
20.6	42.380 ²⁰⁸	14.58 ¹⁰	43.708 ¹⁸⁴	25.99 ¹³⁹	12.75 ³⁶	66.56 ¹⁸⁵	56.539 ²⁸⁸	49.76 ¹³⁷
	181	11	155	116	30	200	246	147
30.5	42.561	14.69	43.863	27.45	13.05	68.56	56.785	51.23
June 9.5	42.707 ¹⁴⁶	14.81 ¹²	43.985 ¹²²	28.95 ¹⁵⁰	13.28 ²³	70.65 ²⁰⁹	56.981 ¹⁹⁶	52.79 ¹⁵⁶
19.5	42.815 ¹⁰⁸	14.95 ¹⁴	44.074 ⁸⁹	30.44 ¹⁴⁹	13.44 ¹⁶	72.80 ²¹⁵	57.124 ¹⁴³	54.39 ¹⁶⁰
29.5	42.885 ⁷⁰	14.95 ¹¹	44.125 ⁵¹	31.87 ¹⁴³	13.53 ⁹	74.95 ²¹⁵	57.208 ⁸⁴	55.98 ¹⁵⁹
July 9.4	42.910 ²⁵	15.09 ¹⁷	44.137 ¹²	33.20 ¹³³	13.53 ⁰	77.02 ²⁰⁷	57.232 ²⁴	57.55 ¹⁵⁷
	17	19	25	120	7	193	36	147
19.4	42.893	15.45	44.112	34.40	13.46	78.95	57.196	59.02
29.4	42.832 ⁶¹	15.61 ¹⁶	44.049 ⁶³	35.46 ¹⁰⁶	13.32 ¹⁴	80.72 ¹⁷⁷	57.101 ⁹⁵	60.36 ¹³⁴
Aug. 8.3	42.734 ⁹⁸	15.77 ¹⁶	43.953 ⁹⁶	36.36 ⁹⁰	13.10 ²²	82.21 ¹⁴⁹	56.952 ¹⁴⁹	61.51 ¹¹⁵
18.3	42.601 ¹³³	15.89 ¹²	43.824 ¹²⁹	37.05 ⁶⁹	12.82 ²⁸	83.44 ¹²³	56.754 ¹⁹⁸	62.44 ⁹³
28.3	42.440 ¹⁶¹	15.94 ⁵	43.671 ¹⁵³	37.57 ⁵²	12.50 ³²	84.31 ⁸⁷	56.516 ²³⁸	63.09 ⁶⁵
	181	1	173	32	37	48	267	37
Sept. 7.3	42.259	15.95	43.498	37.89	12.13	84.79	56.249	63.46
17.2	42.066 ¹⁹³	15.88 ⁷	43.316 ¹⁸²	38.00 ¹¹	11.74 ³⁹	84.85 ⁶	55.967 ²⁸²	63.51 ⁵
27.2	41.872 ¹⁹⁴	15.72 ¹⁶	43.132 ¹⁸⁴	37.89 ¹¹	11.36 ³⁸	84.52 ³³	55.683 ²⁸⁴	63.23 ²⁸
Oct. 7.2	41.689 ¹⁸³	15.51 ²¹	42.957 ¹⁷⁵	37.59 ³⁰	10.99 ³⁷	83.77 ⁷⁵	55.410 ²⁷³	62.62 ⁶¹
17.2	41.523 ¹⁶⁶	15.25 ²⁶	42.799 ¹⁵⁸	37.05 ⁵⁴	10.66 ³³	82.62 ¹¹⁵	55.167 ²⁴³	61.73 ⁸⁹
	131	25	130	76	27	148	202	116
27.1	41.392 ⁹²	15.00 ³⁰	42.669 ⁹⁶	36.29 ⁹⁷	10.39 ²¹	81.14 ¹⁷⁸	54.965 ¹⁴⁷	60.57 ¹³⁶
Nov. 6.1	41.300 ⁴⁸	14.70 ²⁴	42.573 ⁵⁴	35.32 ¹¹⁹	10.18 ¹²	79.36 ¹⁹⁶	54.818 ⁸⁵	59.21 ¹⁵²
16.1	41.252 ³	14.46 ¹⁸	42.519 ⁹	34.13 ¹⁴⁰	10.06 ⁴	77.40 ²¹⁴	54.733 ¹⁵	57.69 ¹⁶¹
26.0	41.255 ⁵⁸	14.28 ⁹	42.510 ⁴⁰	32.73 ¹⁵⁷	10.02 ⁶	75.26 ²¹⁷	54.718 ⁵⁹	56.08 ¹⁶¹
Dec. 6.0	41.313 ¹¹¹	14.19 ⁰	42.550 ⁸⁶	31.16 ¹⁷²	10.08 ¹⁵	73.09 ²¹⁵	54.777 ¹³¹	54.47 ¹⁵⁷
16.0	41.424	14.19	42.636	29.44	10.23	70.94	54.908	52.90
26.0	41.583 ¹⁵⁹	14.30 ¹¹	42.767 ¹³¹	27.62 ¹⁸²	10.48 ²⁵	68.92 ²⁰²	55.108 ²⁰⁰	51.43 ¹⁴⁷
35.9	41.785 ²⁰²	14.54 ²⁴	42.941 ¹⁷⁴	25.76 ¹⁸⁶	10.80 ³²	67.09 ¹⁸³	55.370 ²⁶²	50.14 ¹²⁹
Mean Place	39.915	21.62	41.608	22.37	8.480	78.65	53.175	60.67
Sec δ , Tan δ	1.096	-0.447	1.003	+0.074	2.038	-1.776	1.550	-1.184
$D\psi\alpha$, $D\omega\alpha$	+0.073	-0.005	+0.059	+0.001	+0.108	-0.018	+0.092	-0.012
$D\psi\delta$, $D\omega\delta$	-0.07	-0.99	-0.06	-0.99	-0.06	-0.99	-0.06	-0.99

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Herculis. Mag. 4.5		λ Scorpii. Mag. 1.7		β Draconis. Mag. 3.0		α Ophiuchi. Mag. 2.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 27 s	° ' " +26 9	h m 17 28 s	° ' " -37 2	h m 17 28 s	° ' " +52 21	h m 17 31 s	° ' " +12 36
Jan. 1.0	36.015	69.62	20.999	44.16	39.242	32.19	20.135	60.73
10.9	36.197 ¹⁸²	66.83 ²⁷⁹	21.246 ²⁴⁷	43.64 ⁵²	39.438 ¹⁹⁶	28.73 ³⁴⁶	20.318 ¹⁸³	58.51 ²²²
20.9	36.417 ²²⁰	64.19 ²⁶¹	21.532 ²⁸⁶	43.26 ³⁸	39.694 ²⁵⁶	25.48 ³²⁵	20.532 ²¹⁴	56.37 ²¹⁴
30.9	36.666 ²⁴⁹	61.83 ²³⁶	21.846 ³¹⁴	43.03 ²³	40.002 ³⁰⁸	22.61 ²⁸⁷	20.776 ²⁴⁴	54.44 ¹⁹³
Feb. 9.8	36.940 ²⁷⁴	59.81 ²⁰²	22.184 ³³⁸	42.94 ⁹	40.351 ³⁴⁹	20.21 ²⁴⁰	21.038 ²⁶²	52.76 ¹⁶⁸
19.8	37.230 ²⁹⁰	58.20 ¹⁶¹	22.537 ³⁵³	42.97 ³	40.728 ³⁷⁷	18.34 ¹⁸⁷	21.315 ²⁷⁷	51.41 ¹³⁵
Mar. 1.8	37.530 ³⁰⁰	57.08 ¹¹²	22.895 ³⁵⁸	43.12 ¹⁵	41.128 ⁴⁰⁰	17.07 ¹²⁷	21.600 ²⁸⁵	50.43 ⁹⁸
11.8	37.832 ³⁰²	56.51 ⁵⁷	23.258 ³⁶³	43.36 ²⁴	41.538 ⁴¹⁰	16.46 ⁶¹	21.887 ²⁸⁷	49.87 ⁵⁶
21.7	38.132 ³⁰⁰	56.45 ⁶	23.615 ³⁵⁷	43.67 ³¹	41.945 ⁴⁰⁷	16.50 ⁴	22.173 ²⁸⁶	49.72 ¹⁵
31.7	38.425 ²⁹³	56.91 ⁴⁶	23.964 ³⁴⁹	44.06 ³⁹	42.340 ³⁹⁵	17.21 ⁷¹	22.452 ²⁷⁹	50.00 ²⁸
Apr. 10.7	38.704 ²⁷⁹	57.86 ⁹⁵	24.302 ³³⁸	44.53 ⁴⁷	42.714 ³⁷⁴	18.51 ¹³⁰	22.719 ²⁶⁷	50.69 ⁶⁹
20.7	38.966 ²⁶²	59.25 ¹³⁹	24.623 ³²¹	45.06 ⁵³	43.057 ³⁴³	20.35 ¹⁸⁴	22.971 ²⁵²	51.71 ¹⁰²
30.6	39.205 ²³⁹	61.04 ¹⁷⁹	24.924 ³⁰¹	45.65 ⁵⁹	43.366 ³⁰⁹	22.66 ²³¹	23.205 ²³⁴	53.04 ¹³³
May 10.6	39.419 ²¹⁴	63.12 ²⁰⁸	25.198 ²⁷⁴	46.31 ⁶⁶	43.627 ²⁶¹	25.36 ²⁷⁰	23.421 ²¹⁶	54.63 ¹⁵⁹
20.6	39.602 ¹⁸³	65.44 ²³²	25.444 ²⁴⁶	47.04 ⁷³	43.839 ²¹²	28.33 ²⁹⁷	23.607 ¹⁸⁶	56.41 ¹⁷⁸
30.5	39.753 ¹¹⁴	67.90 ²⁵³	25.655 ¹⁷⁰	47.83 ⁸³	43.998 ⁹⁹	31.49 ³²⁵	23.765 ¹²⁴	58.29 ¹⁹⁴
June 9.5	39.867 ⁷⁵	70.43 ²⁵¹	25.825 ¹²⁸	48.66 ⁸⁹	44.097 ⁴⁰	34.74 ³²²	23.889 ⁸⁹	60.23 ¹⁹³
19.5	39.942 ³¹	72.94 ²¹³	25.953 ⁸²	49.55 ⁸⁹	44.137 ¹⁹	37.96 ³¹³	23.978 ⁵²	62.16 ¹⁸⁶
29.5	39.976 ⁸	75.37 ²²⁸	26.035 ³³	50.44 ⁸⁹	44.118 ⁷⁸	41.09 ²⁹³	24.030 ¹³	64.02 ¹⁷⁵
July 9.4	39.968 ⁴⁸	77.65 ²⁰⁹	26.068 ¹⁷	51.33 ⁸⁴	44.040 ¹³⁷	44.02 ²⁶⁸	24.043 ²⁴	65.77 ¹⁵⁸
19.4	39.920 ⁸⁹	79.74 ¹⁸³	26.051 ⁶⁵	52.17 ⁷⁹	43.903 ¹⁹¹	46.70 ²³⁵	24.019 ⁶⁶	67.35 ¹⁴³
29.4	39.831 ¹²⁸	81.57 ¹⁵⁵	25.986 ¹¹⁰	52.96 ⁶⁸	43.712 ²³⁸	49.05 ¹⁹⁹	23.953 ¹⁰¹	68.78 ¹¹⁹
Aug. 8.4	39.703 ¹⁵⁹	83.12 ¹²²	25.876 ¹⁵⁰	53.64 ⁵⁴	43.474 ²⁸⁰	51.04 ¹⁵⁶	23.852 ¹³³	69.97 ⁹⁶
18.3	39.544 ¹⁸⁶	84.34 ⁸⁸	25.726 ¹⁸⁴	54.18 ⁴⁰	43.194 ³¹⁵	52.60 ¹¹²	23.719 ¹⁵⁸	70.93 ⁶⁸
28.3	39.358 ²⁰⁵	85.22 ⁵³	25.542 ²⁰⁹	54.58 ²¹	42.879 ³⁴¹	53.72 ⁶⁰	23.561 ¹⁷⁸	71.61 ⁴²
Sept. 7.3	39.153 ²¹⁶	85.75 ¹⁴	25.333 ²²²	54.79 ⁰	42.538 ³⁵⁴	54.32 ¹²	23.383 ¹⁹⁰	72.03 ¹⁷
17.2	38.937 ²¹⁹	85.89 ²⁵	25.111 ²²⁶	54.79 ¹⁹	42.184 ³⁵⁷	54.44 ³⁷	23.193 ¹⁹²	72.20 ¹⁶
27.2	38.718 ²¹¹	85.64 ⁶⁴	24.885 ²¹⁵	54.60 ³⁸	41.827 ³⁴¹	54.07 ⁹¹	23.001 ¹⁸⁶	72.04 ⁴²
Oct. 7.2	38.507 ¹⁹³	85.00 ¹⁰¹	24.670 ¹⁹³	54.22 ⁵⁷	41.483 ³²⁴	53.16 ¹⁴¹	22.815 ¹⁶⁸	71.62 ⁷⁴
17.2	38.314 ¹⁶⁶	83.99 ¹⁴⁰	24.477 ¹⁶⁰	53.65 ⁷³	41.159 ²⁸⁹	51.75 ¹⁸⁶	22.647 ¹⁴⁵	70.88 ¹⁰⁰
27.1	38.148 ¹²⁹	82.59 ¹⁷⁶	24.317 ¹¹⁵	52.92 ⁸²	40.870 ²⁴²	49.89 ²³⁶	22.502 ¹⁰⁹	69.88 ¹²⁹
Nov. 6.1	38.019 ⁸⁹	80.83 ²⁰⁸	24.202 ⁶²	52.10 ⁹⁰	40.628 ¹⁸⁷	47.53 ²⁷⁵	22.393 ⁶⁷	68.59 ¹⁵⁵
16.1	37.930 ⁴⁰	78.75 ²³⁸	24.140 ⁶	51.20 ⁹²	40.441 ¹²⁹	44.78 ³¹²	22.326 ²⁸	67.04 ¹⁸⁰
26.1	37.890 ¹¹	76.37 ²⁶²	24.134 ⁵³	50.28 ⁹⁰	40.312 ⁵⁴	41.66 ³³⁵	22.298 ²⁵	65.24 ¹⁹⁹
Dec. 6.0	37.901 ⁶³	73.75 ²⁷⁹	24.187 ¹¹⁴	49.38 ⁸²	40.258 ¹⁶	38.31 ³⁵⁴	22.323 ⁷¹	63.25 ²¹²
16.0	37.964 ¹¹¹	70.96 ²⁸⁷	24.301 ¹⁷⁰	48.56 ⁷¹	40.274 ⁸⁶	34.77 ³⁶⁰	22.394 ¹¹⁷	61.13 ²²⁶
26.0	38.075 ¹⁵⁷	68.09 ²⁸⁸	24.471 ²²⁰	47.85 ⁵⁷	40.360 ¹⁵⁹	31.17 ³⁵⁸	22.511 ¹⁶¹	58.87 ²²⁸
35.9	38.232	65.21	24.691	47.28	40.519	27.59	22.672	56.59
Mean Place	37.567	63.87	22.661	56.42	41.520	28.10	21.561	53.66
Sec δ, Tan δ	1.114	+0.491	1.253	-0.755	1.638	+1.297	1.025	+0.224
Dψα, Dωα	+0.048	+0.005	+0.081	-0.007	+0.027	+0.012	+0.055	+0.002
Dψδ, Dωδ	-0.06	-0.99	-0.05	-0.99	-0.05	-0.99	-0.05	-0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Serpentis. Mag. 3.6		ι Herculis. Mag. 3.8		ω Draconis. Mag. 4.9		η Pavonis. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 33 s	° ' -15 20 "	h m 17 37 s	° ' +46 2 "	h m 17 37 s	° ' +68 47 "	h m 17 38 s	° ' -64 40 "
Jan. 1.0	9.120	54.61	15.487	52.84	20.23	41.41	7.12	67.23
10.9	9.321	55.33	15.664	49.48	20.45	37.85	7.50	65.19
20.9	9.557	56.08	15.894	46.31	20.79	34.53	7.97	63.41
30.9	9.816	56.83	16.169	43.44	21.21	31.56	8.49	61.92
Feb. 9.8	10.096	57.54	16.477	41.04	21.72	29.05	9.07	60.74
19.8	10.386	58.15	16.818	39.14	22.30	27.09	9.68	59.91
Mar. 1.8	10.684	58.67	17.176	37.82	22.92	25.75	10.31	59.44
11.8	10.984	59.06	17.541	37.10	23.56	25.06	10.95	59.30
21.7	11.282	59.26	17.909	37.05	24.21	25.07	11.60	59.50
31.7	11.573	59.34	18.266	37.62	24.84	25.74	12.23	60.05
Apr. 10.7	11.855	59.27	18.607	38.80	25.44	27.04	12.84	60.90
20.7	12.124	59.07	18.926	40.48	25.98	28.90	13.42	62.06
30.6	12.377	58.78	19.213	42.65	26.45	31.27	13.96	63.49
May 10.6	12.609	58.40	19.467	45.20	26.85	34.02	14.45	65.18
20.6	12.819	57.98	19.678	48.04	27.16	37.10	14.88	67.09
30.5	12.998	57.53	19.841	51.09	27.37	40.36	15.24	69.15
June 9.5	13.146	57.09	19.956	54.22	27.48	43.71	15.53	71.37
19.5	13.257	56.68	20.019	57.35	27.49	47.07	15.73	73.66
29.5	13.332	56.31	20.028	60.40	27.40	50.35	15.85	75.97
July 9.4	13.365	55.99	19.985	63.31	27.20	53.44	15.88	78.23
19.4	13.358	55.70	19.889	65.96	26.91	56.27	15.81	80.40
29.4	13.310	55.50	19.743	68.30	26.53	58.77	15.66	82.40
Aug. 8.4	13.225	55.31	19.556	70.30	26.08	60.90	15.42	84.15
18.3	13.104	55.18	19.323	71.93	25.55	62.60	15.12	85.60
28.3	12.956	55.08	19.060	73.09	24.98	63.83	14.75	86.71
Sept. 7.3	12.785	54.99	18.772	73.80	24.36	64.57	14.33	87.40
17.2	12.602	54.93	18.469	74.06	23.72	64.79	13.89	87.66
27.2	12.416	54.89	18.162	73.80	23.07	64.48	13.44	87.48
Oct. 7.2	12.237	54.88	17.863	73.07	22.44	63.65	13.00	86.84
17.2	12.076	54.89	17.582	71.81	21.84	62.28	12.60	85.77
27.1	11.942	54.95	17.332	70.11	21.29	60.40	12.26	84.31
Nov. 6.1	11.844	55.08	17.122	67.94	20.80	58.04	11.99	82.51
16.1	11.790	55.30	16.962	65.38	20.40	55.28	11.81	80.45
26.1	11.783	55.59	16.854	62.47	20.09	52.16	11.73	78.19
Dec. 6.0	11.825	56.01	16.810	59.28	19.90	48.74	11.76	75.83
16.0	11.915	56.54	16.830	55.89	19.81	45.12	11.89	73.48
26.0	12.053	57.16	16.911	52.41	19.85	41.42	12.13	71.19
35.9	12.233	57.87	17.054	48.96	20.00	37.76	12.46	69.07
Mean Place	10.541	64.49	17.489	47.89	24.018	37.10	10.213	81.13
Sec δ , Tan δ	1.037	-0.274	1.441	+1.037	2.765	+2.578	2.339	-2.114
$D\psi\alpha$, $D\omega\alpha$	+0.068	-0.002	+0.034	+0.007	-0.007	+0.017	+0.117	-0.013
$D\psi\delta$, $D\omega\delta$	-0.05	-0.99	-0.04	-1.00	-0.04	-1.00	-0.04	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Ophiuchi. Mag. 2.9		ι^1 Scorpii. Mag. 3.1		ψ Draconis. Mag. 4.9		μ Herculis. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 39 s	° ' " + 4 35 "	h m 17 42 s	° ' " -40 5 "	h m 17 43 s	° ' " +72 11 "	h m 17 43 s	° ' " +27 45 "
Jan. 1.0	38.690	61.94	10.137	43.37	13.77	18.12	25.076	59.47
10.9	38.868 ¹⁷⁸	60.14 ¹⁸⁰	10.376 ²³⁹	42.58 ⁷⁹	14.00 ²³	14.55 ³⁵⁷	25.243 ¹⁶⁷	56.60 ²⁸⁷
20.9	39.078 ²¹⁰	58.40 ¹⁷⁴	10.657 ²⁸¹	41.94 ⁶⁴	14.36 ³⁶	11.20 ³³⁵	25.447 ²⁰⁴	53.88 ²⁷²
30.9	39.317 ²³⁹	56.79 ¹⁶¹	10.972 ³¹⁵	41.45 ⁴⁹	14.83 ⁴⁷	8.19 ³⁰¹	25.684 ²³⁷	51.41 ²⁴⁷
Feb. 9.9	39.573 ²⁵⁶	55.38 ¹⁴¹	11.312 ³⁴⁰	41.11 ³⁴	15.41 ⁵⁸	5.62 ²⁵⁷	25.948 ²⁶⁴	49.25 ²¹⁶
19.8	39.845 ²⁷²	54.23 ¹¹⁵	11.671 ³⁵⁹	40.92 ¹⁹	16.06 ⁶⁵	3.59 ²⁰³	26.232 ²⁸⁴	47.54 ¹⁷¹
Mar. 1.8	40.126 ²⁸¹	53.37 ⁸⁶	12.040 ³⁶⁹	40.85 ⁷	16.77 ⁷¹	2.17 ¹⁴²	26.529 ²⁹⁷	46.33 ¹²¹
11.8	40.409 ²⁸³	52.86 ⁵¹	12.413 ³⁷³	40.90 ⁵	17.52 ⁷⁵	1.43 ⁷⁴	26.831 ³⁰²	45.62 ⁷¹
21.7	40.692 ²⁸³	52.71 ¹⁵	12.786 ³⁷³	41.07 ¹⁷	18.28 ⁷⁶	1.35 ⁸	27.135 ³⁰⁴	45.46 ¹⁶
31.7	40.969 ²⁷⁷	52.90 ¹⁹	13.154 ³⁶⁸	41.35 ²⁸	19.01 ⁷³	1.92 ⁵⁷	27.433 ²⁹⁸	45.84 ³⁸
Apr. 10.7	41.238 ²⁶⁹	53.42 ⁵²	13.510 ³⁵⁶	41.73 ³⁸	19.71 ⁷⁰	3.13 ¹²¹	27.720 ²⁸⁷	46.69 ⁸⁵
20.7	41.496 ²⁵⁸	54.24 ⁸²	13.853 ³⁴³	42.21 ⁴⁸	20.35 ⁶⁴	4.92 ¹⁷⁹	27.992 ²⁷²	48.04 ¹³⁵
30.6	41.737 ²⁴¹	55.32 ¹⁰⁸	14.176 ³²³	42.79 ⁵⁸	20.92 ⁵⁷	7.21 ²²⁹	28.244 ²⁵²	49.79 ¹⁷⁵
May 10.6	41.957 ²²⁰	56.60 ¹²⁸	14.474 ²⁹⁸	43.48 ⁶⁹	21.38 ⁴⁶	9.91 ²⁷⁰	28.472 ²²⁸	51.88 ²⁰⁹
20.6	42.154 ¹⁹⁷	58.04 ¹⁴⁴	14.742 ²⁶⁸	44.26 ⁷⁸	21.75 ³⁷	12.93 ³⁰²	28.669 ³⁰⁷	54.21 ²³³
30.6	42.322 ¹⁶⁸	59.58 ¹⁵⁴	14.976 ²³⁴	45.13 ⁸⁷	21.99 ²⁴	16.15 ³²²	28.832 ¹⁶³	56.71 ²⁵⁰
June 9.5	42.461 ¹³⁹	61.14 ¹⁵⁶	15.169 ¹⁹³	46.08 ⁹⁵	22.12 ¹³	19.48 ³³³	28.962 ¹³⁰	59.29 ²⁵⁸
19.5	42.563 ¹⁰²	62.70 ¹⁵⁰	15.318 ¹⁴⁹	47.09 ¹⁰¹	22.13 ¹	22.82 ³³⁴	29.050 ⁸⁸	61.88 ²⁵⁹
29.5	42.629 ⁶⁶	64.20 ¹⁵⁰	15.417 ⁹⁹	48.13 ¹⁰⁴	22.01 ¹²	26.11 ³²⁹	29.097 ⁴⁷	64.41 ²⁵³
July 9.4	42.656 ²⁷	65.62 ¹⁴²	15.466 ⁴⁹	49.19 ¹⁰⁶	21.78 ²³	29.20 ³⁰⁹	29.100 ³	66.79 ²³⁸
19.4	42.644 ¹²	66.90 ¹²⁸	15.461 ⁵	50.22 ¹⁰³	21.43 ³⁵	32.02 ²⁸²	29.060 ⁴⁰	68.99 ²²⁰
29.4	42.594 ⁵⁰	68.02 ¹¹²	15.406 ⁵⁵	51.19 ⁹⁷	20.98 ⁴⁵	34.57 ²⁵⁵	28.981 ⁷⁹	70.97 ¹⁹⁸
Aug. 8.4	42.507 ⁸⁷	68.98 ⁹⁶	15.301 ¹⁰⁵	52.06 ⁸⁷	20.43 ⁵⁵	36.74 ²¹⁷	28.860 ¹²¹	72.63 ¹⁶⁶
18.3	42.386 ¹²¹	69.75 ⁷⁷	15.152 ¹⁴⁹	52.79 ⁷³	19.81 ⁶²	38.49 ¹⁷⁵	28.703 ¹⁵⁷	73.97 ¹³⁴
28.3	42.238 ¹⁴⁸	70.32 ⁵⁷	14.967 ¹⁸⁵	53.35 ⁵⁶	19.12 ⁶⁹	39.76 ¹²⁷	28.521 ¹⁸²	75.01 ¹⁰⁴
Sept. 7.3	42.069 ¹⁶⁰	70.70 ³⁸	14.751 ²¹⁶	53.72 ³⁷	18.38 ⁷⁴	40.56 ⁸⁰	28.314 ²⁰⁷	75.65 ⁶⁴
17.3	41.886 ¹⁸³	70.85 ¹⁵	14.519 ²³²	53.85 ¹³	17.62 ⁷⁶	40.85 ²⁹	28.093 ²²¹	75.90 ²⁵
27.2	41.700 ¹⁸⁶	70.79 ⁶	14.282 ²³⁷	53.76 ⁹	16.85 ⁷⁷	40.62 ²³	27.868 ²²⁵	75.77 ¹³
Oct. 7.2	41.520 ¹⁸⁰	70.52 ²⁷	14.051 ²³¹	53.43 ³³	16.08 ⁷⁷	39.83 ⁷⁹	27.647 ²²¹	75.21 ⁵⁶
17.2	41.354 ¹⁶⁶	70.03 ⁴⁹	13.841 ²¹⁰	52.89 ⁵⁴	15.35 ⁷³	38.54 ¹²⁹	27.440 ²⁰⁷	74.26 ⁹⁵
27.1	41.216 ¹³⁸	69.30 ⁷³	13.664 ¹⁷⁷	52.15 ⁷⁴	14.68 ⁶⁷	36.73 ¹⁸¹	27.261 ¹⁷⁹	72.93 ¹³³
Nov. 6.1	41.107 ¹⁰⁹	68.37 ⁹³	13.530 ¹³⁴	51.26 ⁸⁹	14.08 ⁶⁰	34.45 ²²⁸	27.115 ¹⁴⁶	71.20 ¹⁷³
16.1	41.040 ⁶⁷	67.20 ¹¹⁷	13.448 ⁸²	50.26 ¹⁰⁰	13.57 ⁵¹	31.73 ²⁷²	27.011 ¹⁰⁴	69.14 ²⁰⁶
26.1	41.016 ²⁴	65.84 ¹³⁶	13.425 ²³	49.20 ¹⁰⁶	13.17 ⁴⁰	28.65 ³⁰⁸	26.949 ⁶²	66.76 ²³⁸
Dec. 6.0	41.039 ²³	64.30 ¹⁵⁴	13.463 ³⁸	48.13 ¹⁰⁷	12.90 ²⁷	25.28 ³³⁷	26.941 ⁸	64.17 ²⁵⁹
16.0	41.108 ⁶⁹	62.62 ¹⁶⁸	13.563 ¹⁰⁰	47.10 ¹⁰³	12.76 ¹⁴	21.69 ³⁵⁹	26.983 ⁴²	61.34 ²⁸³
26.0	41.224 ¹¹⁶	60.84 ¹⁷⁸	13.721 ¹⁵⁸	46.14 ⁹⁶	12.76 ⁰	18.00 ³⁶⁹	27.074 ⁹¹	58.42 ²⁹²
36.0	41.381 ¹⁵⁷	59.01 ¹⁸³	13.932 ²¹¹	45.30 ⁸⁴	12.90 ¹⁴	14.33 ³⁶⁷	27.215 ¹⁴¹	55.47 ²⁹⁵
Mean Place	40.091	54.02	11.922	55.21	18.219	13.35	26.656	53.19
Sec δ , Tan δ	1.003	+0.080	1.307	-0.842	3.269	+3.113	1.130	+0.526
$D\psi\alpha$, $D\omega\alpha$	+0.059	0.000	+0.083	-0.004	-0.021	+0.015	+0.047	+0.003
$D\psi\delta$, $D\omega\delta$	-0.04	-1.00	-0.03	-1.00	-0.03	-1.00	-0.03	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Ophiuchi. Mag. 3.7		ξ Draconis. Mag. 3.9		89 Herculis. Mag. 5.5		35 Draconis. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 44 s	° ' + 2 44 "	h m 17 52 s	° ' +56 52 "	h m 17 52 s	° ' +26 3 "	h m 17 52 s	° ' +76 58 "
Jan. 1.0	0.457	14.62	9.411	69.20	17.279	47.41	47.72	32.10
10.9	0.633	12.92	9.576	65.64	17.436	44.64	47.94	28.57
20.9	0.842	11.29	9.809	62.28	17.632	41.99	48.35	25.22
30.9	1.076	9.76	10.106	59.24	17.861	39.57	48.93	22.20
Feb. 9.9	1.332	8.41	10.456	56.62	18.117	37.47	49.65	19.58
19.8	1.602	7.30	10.849	54.51	18.393	35.76	50.49	17.49
Mar. 1.8	1.880	6.49	11.273	53.00	18.684	34.53	51.42	15.99
11.8	2.163	5.98	11.714	52.13	18.982	33.81	52.40	15.13
21.7	2.446	5.81	12.162	51.92	19.282	33.62	53.41	14.94
31.7	2.724	5.98	12.605	52.39	19.579	33.95	54.40	15.42
Apr. 10.7	2.994	6.46	13.030	53.49	19.868	34.78	55.34	16.52
20.7	3.252	7.23	13.428	55.16	20.142	36.08	56.21	18.20
30.6	3.496	8.24	13.786	57.35	20.399	37.79	56.97	20.39
May 10.6	3.721	9.45	14.100	59.95	20.632	39.81	57.61	23.00
20.6	3.921	10.80	14.360	62.91	20.838	42.10	58.10	25.96
30.6	4.095	12.23	14.560	66.07	21.011	44.56	58.44	29.13
June 9.5	4.238	13.72	14.697	69.38	21.150	47.11	58.62	32.43
19.5	4.347	15.18	14.767	72.72	21.251	49.68	58.62	35.77
29.5	4.418	16.59	14.769	75.99	21.308	52.20	58.46	39.05
July 9.4	4.450	17.91	14.702	79.12	21.323	54.59	58.14	42.18
19.4	4.443	19.10	14.569	82.03	21.296	56.80	57.66	45.08
29.4	4.398	20.15	14.373	84.64	21.226	58.79	57.05	47.69
Aug. 8.4	4.314	21.04	14.118	86.90	21.116	60.50	56.30	49.95
18.3	4.197	21.75	13.814	88.76	20.971	61.91	55.45	51.81
28.3	4.052	22.29	13.467	90.18	20.795	62.97	54.51	53.23
Sept. 7.3	3.885	22.64	13.087	91.12	20.596	63.68	53.49	54.16
17.3	3.704	22.79	12.687	91.55	20.382	64.02	52.44	54.59
27.2	3.519	22.75	12.278	91.47	20.162	63.97	51.37	54.51
Oct. 7.2	3.338	22.50	11.875	90.87	19.945	63.53	50.30	53.91
17.2	3.173	22.06	11.489	89.75	19.741	62.70	49.28	52.78
27.1	3.032	21.40	11.137	88.12	19.563	61.48	48.32	51.15
Nov. 6.1	2.923	20.55	10.826	86.00	19.415	59.90	47.45	49.04
16.1	2.854	19.49	10.573	83.44	19.306	57.98	46.70	46.50
26.1	2.828	18.22	10.385	80.48	19.243	55.74	46.09	43.54
Dec. 6.0	2.849	16.79	10.268	77.22	19.229	53.24	45.64	40.30
16.0	2.916	15.22	10.230	73.72	19.264	50.55	45.38	36.82
26.0	3.029	13.53	10.271	70.10	19.349	47.75	45.28	33.20
36.0	3.183	11.80	10.388	66.47	19.481	44.92	45.40	29.59
Mean Place	1.857	6.49	11.913	63.58	18.835	40.69	53.661	26.51
Sec δ , Tan δ	1.001	+0.048	1.831	+1.533	1.113	+0.489	4.437	+4.323
$D\alpha$, $D\omega$	+0.060	0.000	+0.021	+0.003	+0.048	+0.001	-0.053	+0.009
$D\delta$, $D\omega\delta$	-0.03	-1.00	-0.01	-1.00	-0.01	-1.00	-0.01	-1.00

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Herculis. Mag. 4.0		ξ Herculis. Mag. 3.8		ν Ophiuchi. Mag. 3.5		γ Draconis. Mag. 2.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 53 s	° ' +37 15 "	h m 17 54 s	° ' +29 15 "	h m 17 54 s	° ' - 9 45 "	h m 17 54 s	° ' +51 29 "
Jan. 1.0	34.977	41.80	44.773	25.67	45.770	46.45	46.871	56.39
10.9	35.130	38.64	44.927	22.78	45.947	47.41	47.028	52.90
20.9	35.330	35.64	45.122	20.01	46.156	48.38	47.242	49.59
30.9	35.571	32.91	45.351	17.49	46.393	49.30	47.514	46.60
Feb. 9.9	35.840	30.56	45.609	15.31	46.651	50.12	47.828	43.97
19.8	36.138	28.61	45.888	13.53	46.925	50.81	48.182	41.88
Mar. 1.8	36.452	27.23	46.182	12.23	47.208	51.34	48.560	40.37
11.8	36.777	26.43	46.486	11.47	47.498	51.69	48.955	39.48
21.8	37.105	26.21	46.792	11.25	47.788	51.81	49.356	39.23
31.7	37.431	26.58	47.095	11.58	48.077	51.72	49.751	39.64
Apr. 10.7	37.745	27.55	47.389	12.44	48.358	51.44	50.135	40.69
20.7	38.043	29.01	47.671	13.78	48.630	50.99	50.494	42.30
30.6	38.319	30.94	47.932	15.54	48.889	50.39	50.823	44.42
May 10.6	38.570	33.26	48.171	17.66	49.130	49.66	51.112	46.94
20.6	38.784	35.85	48.380	20.04	49.348	48.87	51.355	49.82
30.6	38.962	38.66	48.557	22.61	49.542	48.05	51.549	52.92
June 9.5	39.100	41.59	48.698	25.28	49.704	47.22	51.689	56.14
19.5	39.191	44.54	48.798	27.97	49.832	46.42	51.768	59.41
29.5	39.236	47.43	48.855	30.61	49.922	45.69	51.787	62.63
July 9.4	39.233	50.20	48.868	33.12	49.971	45.01	51.749	65.71
19.4	39.183	52.76	48.837	35.45	49.982	44.42	51.648	68.57
29.4	39.086	55.05	48.763	37.54	49.951	43.94	51.492	71.15
Aug. 8.4	38.949	57.08	48.648	39.36	49.879	43.54	51.287	73.39
18.3	38.769	58.72	48.496	40.85	49.771	43.22	51.032	75.23
28.3	38.559	59.97	48.313	41.99	49.633	43.00	50.736	76.67
Sept. 7.3	38.322	60.80	48.106	42.75	49.472	42.87	50.413	77.61
17.3	38.070	61.22	47.883	43.12	49.294	42.81	50.070	78.07
27.2	37.811	61.15	47.654	43.10	49.111	42.83	49.720	78.02
Oct. 7.2	37.554	60.68	47.427	42.66	48.930	42.92	49.373	77.49
17.2	37.313	59.71	47.215	41.81	48.763	43.10	49.042	76.42
27.1	37.096	58.30	47.025	40.55	48.620	43.37	48.740	74.84
Nov. 6.1	36.914	56.47	46.868	38.91	48.508	43.73	48.478	72.81
16.1	36.772	54.21	46.750	36.90	48.437	44.21	48.262	70.33
26.1	36.680	51.63	46.678	34.58	48.409	44.82	48.107	67.45
Dec. 6.0	36.640	48.74	46.656	31.97	48.427	45.52	48.017	64.28
16.0	36.657	45.65	46.685	29.17	48.493	46.33	47.996	60.85
26.0	36.729	42.45	46.764	26.24	48.607	47.23	48.040	57.32
36.0	36.854	39.23	46.891	23.29	48.760	48.21	48.157	53.75
Mean Place	36.720	35.53	46.367	18.99	47.206	55.47	49.073	50.46
Sec δ , Tan δ	1.256	+0.761	1.146	+0.560	1.015	-0.172	1.606	+1.257
$D\psi\alpha$, $D\omega\alpha$	+0.041	+0.001	+0.046	+0.001	+0.066	0.000	+0.028	+0.002
$D\psi\delta$, $D\omega\delta$	-0.01	-1.00	-0.01	-1.00	-0.01	-1.00	-0.01	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	67 Ophiuchi. Mag. 3.9		θ Aræ. Mag. 3.9		γ Sagittarii. Mag. 3.1		70 Ophiuchi. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 17 56 s	° ' " + 2 56 "	h m 18 0 s	° ' " -50 5 "	h m 18 0 s	° ' " -30 25 "	h m 18 1 s	° ' " + 2 30 "
Jan. 1.0	45.915	10.96	35.976	43.50	49.938	25.23	32.330	66.07
10.9	46.080 ¹⁶⁵	9.29 ¹⁶⁷	36.225 ²⁴⁹	42.04 ¹⁴⁶	50.137 ¹⁹⁹	24.89 ³¹	32.491 ¹⁶¹	64.40 ¹⁶⁷
20.9	46.277 ¹⁹⁷	7.66 ¹⁶³	36.527 ³⁰²	40.73 ¹³¹	50.371 ²³⁴	24.67 ²²	32.684 ¹⁹³	62.78 ¹⁶²
30.9	46.502 ²²⁵	6.15 ¹⁵¹	36.874 ³⁴⁷	39.61 ¹¹²	50.638 ²⁶⁷	24.54 ¹³	32.906 ²²²	61.26 ¹⁵²
Feb. 9.9	46.749 ²⁴⁷	4.83 ¹³²	37.255 ³⁸¹	38.68 ⁹³	50.932 ²⁹⁴	24.41 ¹³	33.151 ²⁴⁵	59.93 ¹³³
	265	109	407	72	311	7	261	111
19.8	47.014	3.74	37.662	37.96	51.243	24.34	33.412	58.82
Mar. 1.8	47.288 ²⁷⁴	2.93 ⁸¹	38.087 ⁴²⁵	37.46 ⁵⁰	51.566 ³²³	24.33 ¹	33.685 ²⁷³	57.99 ⁸³
11.8	47.569 ²⁸¹	2.43 ⁵⁰	38.523 ⁴³⁶	37.16 ³⁰	51.897 ³³¹	24.33 ⁰	33.965 ²⁸⁰	57.49 ⁵⁰
21.8	47.851 ²⁸²	2.27 ¹⁶	38.962 ⁴³⁹	37.08 ⁸	52.231 ³³⁴	24.35 ²	34.248 ²⁸³	57.30 ¹⁹
31.7	48.132 ²⁸¹	2.44 ¹⁷	39.399 ⁴³⁷	37.21 ¹³	52.561 ³³⁰	24.36 ¹	34.530 ²⁸²	57.44 ¹⁴
	274	51	429	34	324	4	277	47
Apr. 10.7	48.406	2.95	39.828	37.55	52.885	24.40	34.807	57.91
20.7	48.671 ²⁶⁵	3.72 ⁷⁷	40.243 ⁴¹⁵	38.09 ⁵⁴	53.203 ³¹⁸	24.45 ⁵	35.073 ²⁶⁶	58.66 ⁷⁵
30.6	48.922 ²⁵¹	4.77 ¹⁰⁵	40.637 ³⁹⁴	38.82 ⁷³	53.504 ³⁰¹	24.52 ⁷	35.327 ²³⁴	59.66 ¹⁰⁰
May 10.6	49.156 ²³⁴	6.02 ¹²⁵	41.003 ³⁶⁶	39.74 ⁹²	53.783 ²⁷⁹	24.66 ¹⁴	35.563 ²³⁶	60.86 ¹²⁰
20.6	49.365 ²⁰⁹	7.41 ¹³⁹	41.334 ³³¹	40.84 ¹¹⁰	54.041 ²⁵⁸	24.86 ²⁰	35.778 ²¹⁵	62.21 ¹³⁵
	185	117	291	125	229	23	189	114
30.6	49.550	8.88	41.625	42.09	54.270	25.09	35.967	63.65
June 9.5	49.705 ¹⁵⁵	10.40 ¹⁵²	41.870 ²⁴⁵	43.48 ¹³⁹	54.463 ¹⁹³	25.40 ³¹	36.126 ¹⁵⁹	65.14 ¹⁴⁹
19.5	49.824 ¹¹⁹	11.91 ¹⁵¹	42.061 ¹⁹¹	44.96 ¹⁴⁸	54.618 ¹⁵⁵	25.81 ⁴¹	36.252 ¹²⁶	66.62 ¹⁴⁸
29.5	49.907 ⁸³	13.37 ¹⁴⁶	42.195 ¹³⁴	46.51 ¹⁵⁵	54.727 ¹⁰⁹	26.25 ⁴⁴	36.340 ⁸⁸	68.04 ¹⁴²
July 9.5	49.949 ⁴²	14.74 ¹³⁷	42.269 ⁷¹	48.11 ¹⁶⁰	54.794 ⁶⁷	26.76 ⁵¹	36.388 ⁴⁸	69.36 ¹³²
	4	124	10	157	20	53	9	120
19.4	49.953	15.98	42.279	49.68	54.814	27.29	36.397	70.56
29.4	49.917 ³⁶	17.07 ¹⁰⁹	42.225 ⁵⁴	51.18 ¹⁵⁰	54.784 ³⁰	27.84 ⁵⁵	36.365 ³²	71.63 ¹⁰⁷
Aug. 8.4	49.842 ⁷⁵	18.02 ⁹⁵	42.112 ¹¹³	52.55 ¹³⁷	54.709 ⁷⁵	28.37 ⁵³	36.292 ⁷³	72.53 ⁹⁰
18.3	49.731 ¹¹¹	18.77 ⁷⁵	41.945 ¹⁶⁷	53.74 ¹¹⁹	54.593 ¹¹⁶	28.84 ⁴⁷	36.186 ¹⁰⁶	73.25 ⁷²
28.3	49.591 ¹⁴⁰	19.34 ⁵⁷	41.730 ²¹⁵	54.71 ⁹⁷	54.442 ¹⁵¹	29.24 ⁴⁰	36.049 ¹³⁷	73.78 ⁵³
	163	38	253	69	182	32	160	36
Sept. 7.3	49.428	19.72	41.477	55.40	54.260	29.56	35.889	74.14
17.3	49.249 ¹⁷⁹	19.90 ¹⁸	41.200 ²⁷⁷	55.81 ⁴¹	54.059 ²⁰¹	29.76 ²⁰	35.711 ¹⁷⁸	74.30 ¹⁶
27.2	49.064 ¹⁸⁵	19.89 ¹	40.911 ²⁸⁹	55.88 ⁷	53.850 ²⁰⁹	29.81 ⁵	35.527 ¹⁸⁴	74.26 ⁴
Oct. 7.2	48.880 ¹⁸⁴	19.67 ²²	40.625 ²⁸⁶	55.63 ²⁵	53.645 ²⁰⁵	29.73 ⁸	35.346 ¹⁸¹	74.03 ²³
17.2	48.711 ¹⁶⁹	19.25 ⁴²	40.360 ²⁶⁵	55.04 ⁵⁹	53.454 ¹⁹¹	29.53 ²⁰	35.175 ¹⁷¹	73.59 ⁴⁴
	148	63	233	88	165	34	150	64
27.2	48.563	18.62	40.127	54.16	53.289	29.19	35.025	72.95
Nov. 6.1	48.447 ¹¹⁶	17.79 ⁸³	39.941 ¹⁸⁶	53.01 ¹¹⁵	53.160 ¹²⁹	28.77 ⁴²	34.907 ¹¹⁸	72.12 ⁸³
16.1	48.368 ⁷⁹	16.74 ¹⁰⁵	39.813 ¹²⁸	51.67 ¹³⁴	53.075 ⁸⁵	28.31 ⁴⁶	34.825 ⁸²	71.08 ¹⁰⁴
26.1	48.331 ³⁷	15.50 ¹²⁴	39.751 ⁶²	50.15 ¹⁵²	53.038 ³⁷	27.80 ⁵¹	34.785 ⁴⁰	69.85 ¹²³
Dec. 6.0	48.340 ⁹	14.09 ¹⁴¹	39.760 ⁹	48.55 ¹⁶⁰	53.053 ¹⁵	27.31 ⁴⁹	34.789 ⁴	68.45 ¹⁴⁰
	56	153	79	163	71	47	53	154
16.0	48.396	12.56	39.839	46.92	53.124	26.84	34.842	66.91
26.0	48.495 ⁹⁹	10.91 ¹⁶⁵	39.989 ¹⁵⁰	45.32 ¹⁶⁰	53.250 ¹²⁶	26.43 ⁴¹	34.938 ⁹⁶	65.27 ¹⁶⁴
36.0	48.637 ¹⁴²	9.20 ¹⁷¹	40.202 ²¹³	43.80 ¹⁵²	53.421 ¹⁷¹	26.10 ³³	35.075 ¹³⁷	63.58 ¹⁶⁹
Mean Place	47.331	2.81	38.186	54.88	51.594	35.40	33.750	57.88
Sec δ, Tan δ	1.001	+0.051	1.559	-1.196	1.160	-0.587	1.001	+0.044
Dψα, Dωα	+0.060	0.000	+0.093	0.000	+0.077	0.000	+0.060	0.000
Dψδ, Dωδ	-0.01	-1.00	0.00	-1.00	0.00	-1.00	0.00	-1.00

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Ophiuchi. Mag. 3.7		o Herculis. Mag. 3.8		μ Sagittarii. Mag. 4.0		η Sagittarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 3 s	° ' " + 9 33 "	h m 18 4 s	° ' " +28 44 "	h m 18 9 s	° ' " -21 4 "	h m 18 12 s	° ' " -36 46 "
Jan. 1.0	40.474	14.64	30.709	70.36	7.919	39.85	23.241	59.71
11.0	40.627 ¹⁵³	12.63 ²⁰¹	30.850 ¹⁴¹	67.50 ²⁸⁶	8.094 ¹⁷⁵	40.07 ²²	23.438 ¹⁹⁷	58.95 ⁷⁶
20.9	40.815 ¹⁸⁸	10.70 ¹⁹³	31.035 ¹⁸⁵	64.75 ²⁷⁵	8.303 ²⁰⁹	40.30 ²³	23.676 ²³⁸	58.30 ⁶⁵
30.9	41.031 ²¹⁶	8.91 ¹⁷⁹	31.254 ²¹⁹	62.22 ²⁵³	8.545 ²⁴²	40.58 ²⁸	23.951 ²⁷⁵	57.73 ⁵⁷
Feb. 9.9	41.273 ²⁴²	7.33 ¹⁵⁸	31.504 ²⁵⁰	59.98 ²²⁴	8.810 ²⁶⁵	40.82 ²⁴	24.254 ³⁰³	57.25 ⁴⁸
	258 ¹²⁹		273 ¹⁷⁹		283 ²¹		325 ³⁸	
19.8	41.531	6.04	31.777	58.19	9.093	41.03	24.579	56.87
Mar. 1.8	41.803 ²⁷²	5.08 ⁹⁶	32.067 ²⁹⁰	56.86 ¹³³	9.390 ²⁹⁷	41.20 ¹⁷	24.919 ³⁴⁰	56.57 ³⁰
11.8	42.083 ²⁸⁰	4.51 ⁵⁷	32.367 ³⁰⁰	56.05 ⁸¹	9.694 ³⁰⁴	41.26 ⁶	25.269 ³⁵⁰	56.36 ²¹
21.8	42.365 ²⁸²	4.32 ¹⁹	32.672 ³⁰⁵	55.78 ²⁷	10.002 ³⁰⁸	41.26 ⁰	25.624 ³⁵⁵	56.22 ¹⁴
31.7	42.647 ²⁸²	4.54 ²²	32.976 ³⁰⁴	56.06 ²⁸	10.309 ³⁰⁷	41.14 ¹²	25.980 ³⁵⁶	56.15 ⁷
	276 ⁶⁰		296 ⁷⁷		303 ¹⁸		350 ¹	
Apr. 10.7	42.923	5.14	33.272	56.83	10.612	40.96	26.330	56.16
20.7	43.190 ²⁶⁷	6.07 ⁹³	33.557 ²⁸⁵	58.12 ¹²⁹	10.907 ²⁹⁵	40.73 ²³	26.673 ³⁴³	56.25 ⁹
30.7	43.444 ²⁵⁴	7.32 ¹²⁵	33.824 ²⁶⁷	59.84 ¹⁷²	11.189 ²⁸²	40.43 ³⁰	27.001 ³²⁸	56.45 ²⁰
May 10.6	43.679 ²³⁵	8.80 ¹⁴⁸	34.071 ²¹⁷	61.91 ²⁰⁷	11.456 ²⁶⁷	40.13 ³⁰	27.310 ³⁰⁹	56.74 ²⁹
20.6	43.893 ²¹⁴	10.48 ¹⁶⁸	34.288 ²¹⁷	64.26 ²³⁵	11.700 ²⁴⁴	39.80 ³³	27.596 ²⁸⁶	57.13 ³³
	187 ¹⁸¹		184 ²⁵⁵		219 ³¹		254 ⁵¹	
30.6	44.080	12.29	34.472	66.81	11.919	39.49	27.850	57.64
June 9.5	44.236 ¹⁵⁶	14.16 ¹⁸⁷	34.624 ¹⁵²	69.46 ²⁶⁵	12.106 ¹⁸⁷	39.26 ²³	28.068 ²¹⁸	58.25 ⁶¹
19.5	44.356 ¹²⁰	16.02 ¹⁸⁶	34.732 ¹⁰⁸	72.14 ²⁶⁸	12.259 ¹⁵³	39.07 ¹⁹	28.245 ¹⁷⁷	58.97 ⁷²
29.5	44.441 ⁸⁵	17.85 ¹⁸³	34.800 ⁶⁸	74.81 ²⁶⁷	12.368 ¹⁰⁹	38.96 ¹¹	28.376 ¹³¹	59.76 ⁷⁹
July 9.5	44.484 ⁴³	19.57 ¹⁷²	34.824 ²⁴	77.35 ²⁵¹	12.438 ⁷⁰	38.86 ¹⁰	28.458 ⁸²	60.61 ⁸⁵
	4 ¹⁵⁹		22 ²³⁶		21 ²		30 ⁸⁰	
19.4	44.488	21.16	34.802	79.71	12.462	38.88	28.488	61.50
29.4	44.451 ³⁷	22.58 ¹⁴²	34.735 ⁶⁷	81.87 ²¹⁶	12.445 ¹⁷	38.95 ⁷	28.467 ²¹	62.38 ⁸⁸
Aug. 8.4	44.375 ⁷⁶	23.79 ¹²¹	34.631 ¹⁰⁴	83.72 ¹⁸⁵	12.383 ⁶²	39.06 ¹¹	28.396 ⁷¹	63.23 ⁸⁵
18.4	44.263 ¹¹²	24.79 ¹⁰⁰	34.487 ¹⁴⁴	85.29 ¹⁵⁷	12.283 ¹⁰⁰	39.17 ²³	28.277 ¹¹⁹	64.01 ⁷⁸
28.3	44.122 ¹⁴¹	25.56 ⁷⁷	34.309 ¹⁷⁸	86.52 ¹²³	12.145 ¹³⁸	39.36 ¹³	28.119 ¹⁵⁸	64.66 ⁶⁵
	168 ⁵²		203 ⁸⁴		163 ¹²		191 ⁵²	
Sept. 7.3	43.954	26.08	34.106	87.36	11.982	39.48	27.928	65.18
17.3	43.770 ¹⁸⁴	26.36 ²⁸	33.886 ²²⁰	87.80 ⁴⁴	11.799 ¹⁸³	39.58 ¹⁰	27.713 ²¹⁵	65.53 ³⁵
27.2	43.580 ¹⁹⁰	26.37 ¹	33.660 ²²⁶	87.87 ⁷	11.606 ¹⁹³	39.64 ⁶	27.487 ²²⁶	65.68 ¹⁵
Oct. 7.2	43.391 ¹⁸⁹	26.12 ²⁵	33.434 ²²⁶	87.50 ³⁷	11.417 ¹⁸⁹	39.69 ⁵	27.261 ²²⁶	65.63 ⁵
17.2	43.214 ¹⁷⁷	25.61 ⁵¹	33.217 ²¹⁷	86.74 ⁷⁶	11.238 ¹⁷⁹	39.68 ¹	27.050 ²¹¹	65.38 ²⁵
	157 ⁷⁸		193 ¹¹⁶		157 ⁴		187 ⁴³	
27.2	43.057	24.83	33.024	85.58	11.081	39.64	26.863	64.95
Nov. 6.1	42.930 ¹²⁷	23.80 ¹⁰³	32.863 ¹⁶¹	84.01 ¹⁵⁷	10.959 ¹²²	39.61 ³	26.713 ¹⁵⁰	64.36 ⁵⁹
16.1	42.840 ⁹⁰	22.52 ¹²⁸	32.740 ¹²³	82.08 ¹⁹³	10.873 ⁸⁶	39.57 ⁴	26.609 ¹⁰⁴	63.63 ⁷³
26.1	42.790 ⁵⁰	21.01 ¹⁵¹	32.657 ⁸³	79.82 ²²⁶	10.834 ³⁹	39.57 ⁰	26.556 ⁵³	62.82 ⁸¹
Dec. 6.1	42.788 ²	19.30 ¹⁷¹	32.626 ³¹	77.30 ²⁵²	10.842 ⁸	39.60 ³	26.561 ⁵	61.96 ⁸⁶
	42 ¹⁸⁸		18 ²⁷⁵		59 ¹⁰		60 ⁸⁷	
16.0	42.830	17.42	32.644	74.55	10.901	39.70	26.621	61.09
26.0	42.918 ⁸⁸	15.43 ¹⁹⁹	32.714 ⁷⁰	71.66 ²⁸⁹	11.009 ¹⁰⁸	39.85 ¹⁵	26.738 ¹¹⁷	60.26 ⁸³
36.0	43.047 ¹²⁹	13.39 ²⁰⁴	32.832 ¹¹⁸	68.74 ²⁹²	11.161 ¹⁵²	40.07 ²²	26.906 ¹⁶⁸	59.49 ⁷⁷
Mean Place	41.908	6.80	32.296	63.28	9.465	49.14	25.054	69.65
Sec δ, Tan δ	1.014	+0.168	1.141	+0.549	1.072	-0.385	1.249	-0.748
Dψα, Dωα	+0.057	0.000	+0.047	-0.001	+0.071	+0.001	+0.081	+0.003
Dψδ, Dωδ	+0.01	-1.00	+0.01	-1.00	+0.02	-1.00	+0.02	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	Groombridge 2533. Mag. 5.4		36 Draconis. Mag. 5.0		δ Sagittarii. Mag. 2.8		η Serpentis. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 13 s	° ' " +42 7 "	h m 18 13 s	° ' " +64 22 "	h m 18 16 s	° ' " -29 51 "	h m 18 17 s	° ' " - 2 54 "
Jan. 1.0	13.208	63.63	24.17	22.69	2.186	34.77	18.028	63.26
11.0	13.337	60.34	24.30	19.08	2.366	34.42	18.174	64.56
20.9	13.516	57.18	24.52	15.62	2.586	34.13	18.355	65.84
30.9	13.742	54.26	24.83	12.41	2.839	33.90	18.566	67.02
Feb. 9.9	14.006	51.70	25.21	9.58	3.118	33.70	18.802	68.09
19.8	14.302	49.58	25.66	7.25	3.418	33.54	19.056	68.95
Mar. 1.8	14.621	47.99	26.15	5.48	3.731	33.40	19.323	69.60
11.8	14.956	46.98	26.68	4.35	4.055	33.27	19.599	69.99
21.8	15.301	46.59	27.23	3.89	4.384	33.14	19.882	70.10
31.7	15.645	46.81	27.78	4.09	4.714	33.01	20.165	69.95
Apr. 10.7	15.983	47.63	28.31	4.95	5.041	32.89	20.445	69.51
20.7	16.308	49.01	28.81	6.43	5.361	32.80	20.720	68.84
30.7	16.611	50.90	29.28	8.45	5.667	32.73	20.983	67.98
May 10.6	16.887	53.20	29.68	10.93	5.958	32.71	21.232	66.91
20.6	17.130	55.85	30.02	13.78	6.226	32.76	21.461	65.75
30.6	17.333	58.73	30.28	16.93	6.468	32.89	21.663	64.52
June 9.5	17.493	61.78	30.47	20.25	6.675	33.10	21.836	63.28
19.5	17.605	64.89	30.57	23.65	6.845	33.39	21.979	62.05
29.5	17.667	67.96	30.59	27.04	6.973	33.77	22.082	60.87
July 9.5	17.677	70.95	30.52	30.32	7.055	34.21	22.147	59.76
19.4	17.635	73.76	30.36	33.42	7.090	34.71	22.170	58.79
29.4	17.542	76.31	30.12	36.27	7.076	35.24	22.153	57.93
Aug. 8.4	17.401	78.54	29.81	38.78	7.015	35.78	22.095	57.22
18.4	17.216	80.48	29.43	40.91	6.911	36.29	21.998	56.67
28.3	16.994	82.00	28.99	42.62	6.769	36.74	21.870	56.24
Sept. 7.3	16.742	83.09	28.51	43.87	6.595	37.11	21.718	55.96
17.3	16.470	83.73	28.00	44.62	6.400	37.37	21.545	55.84
27.2	16.187	83.92	27.47	44.85	6.193	37.52	21.362	55.87
Oct. 7.2	15.904	83.62	26.94	44.56	5.987	37.54	21.179	56.05
17.2	15.631	82.83	26.42	43.73	5.791	37.42	21.005	56.35
27.2	15.381	81.57	25.94	42.36	5.619	37.18	20.850	56.82
Nov. 6.1	15.162	79.85	25.50	40.48	5.480	36.85	20.724	57.43
16.1	14.985	77.70	25.12	38.13	5.383	36.44	20.634	58.21
26.1	14.856	75.16	24.81	35.35	5.333	35.99	20.584	59.11
Dec. 6.1	14.780	72.30	24.60	32.20	5.337	35.52	20.577	60.18
16.0	14.761	69.17	24.47	28.77	5.392	35.07	20.616	61.36
26.0	14.800	65.89	24.44	25.18	5.499	34.65	20.698	62.65
36.0	14.896	62.55	24.51	21.51	5.653	34.29	20.825	63.96
Mean Place	15.041	56.42	27.224	15.51	3.866	44.21	19.465	71.60
Sec δ , Tan δ	1.348	+0.905	2.312	+2.085	1.153	-0.574	1.001	-0.051
$D\psi\alpha$, $D\omega\alpha$	+0.037	-0.003	+0.006	-0.008	+0.076	+0.003	+0.063	0.000
$D\psi\delta$, $D\omega\delta$	+0.02	-1.00	+0.02	-1.00	+0.03	-1.00	+0.03	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ε Sagittarii. Mag. 2.0		109 Herculis. Mag. 3.9		α Telescopii. Mag. 3.8		χ Draconis. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 19 s	° ' " -34 25 "	h m 18 20 s	° ' " +21 43 "	h m 18 21 s	° ' " -46 0 "	h m 18 22 s	° ' " +72 41 "
Jan. 1.0	1.863	10.95	23.476	68.39	13.736	35.33	22.54	66.92
11.0	2.048 ¹⁸⁵	10.31 ⁶⁴	23.607 ¹³¹	65.82 ²⁵⁷	13.945 ²⁰⁹	33.98 ¹³⁵	22.65 ¹¹	63.32 ³⁸⁰
20.9	2.274 ²²⁶	9.74 ⁵⁷	23.776 ¹⁶⁹	63.36 ²⁴⁶	14.202 ²⁵⁷	32.74 ¹²⁴	22.90 ²⁵	59.83 ³⁴⁹
30.9	2.535 ²⁶¹	9.24 ⁵⁰	23.979 ²⁰³	61.06 ²³⁰	14.501 ²⁹⁹	31.62 ¹¹²	23.28 ³⁸	56.56 ³²⁷
Feb. 9.9	2.825 ²⁹⁰	8.82 ⁴²	24.210 ²³¹	59.02 ²⁰⁴	14.838 ³³⁷	30.66 ⁹⁶	23.77 ⁴⁹	53.67 ²⁸⁹
	311	38	253	171	363	82	60	243
19.9	3.136	8.44	24.463	57.31	15.201	29.84	24.37	51.24
Mar. 1.8	3.463 ³²⁷	8.14 ³⁰	24.735 ²⁷²	56.05 ¹²⁶	15.584 ³⁸³	29.19 ⁶⁵	25.04 ⁶⁷	49.35 ¹⁸⁹
11.8	3.803 ³⁴⁰	7.90 ²⁴	25.020 ²⁸⁵	55.24 ⁸¹	15.982 ³⁹⁸	28.71 ⁴⁸	25.78 ⁷⁴	48.08 ¹²⁷
21.8	4.149 ³⁴⁶	7.71 ¹⁹	25.311 ²⁹¹	54.92 ³²	16.387 ⁴⁰⁵	28.39 ³²	26.54 ⁷⁶	47.48 ⁶⁰
31.7	4.495 ³⁴⁶	7.56 ¹⁵	25.603 ²⁹²	55.10 ¹⁸	16.794 ⁴⁰⁷	28.23 ¹⁶	27.32 ⁷⁸	47.54 ⁶
	343	9	289	66	404	3	75	72
Apr. 10.7	4.838	7.47	25.892	55.76	17.198	28.26	28.07	48.26
20.7	5.173 ³³⁵	7.45 ²	26.174 ²⁸²	56.87 ¹¹¹	17.592 ³⁹⁴	28.47 ²¹	28.79 ⁷²	49.59 ¹³³
30.7	5.497 ³²⁴	7.52 ⁷	26.442 ²⁶⁸	58.37 ¹⁵⁰	17.972 ³⁸⁰	28.83 ³⁶	29.44 ⁶⁵	51.48 ¹⁸⁹
May 10.6	5.803 ³⁰⁶	7.66 ¹⁴	26.694 ²⁵²	60.21 ¹⁸⁴	18.331 ³⁵⁹	29.40 ⁵⁷	30.02 ⁵⁸	53.87 ²³⁰
20.6	6.086 ²⁸³	7.90 ²⁴	26.921 ²²⁷	62.31 ²¹⁰	18.662 ³³¹	30.13 ⁷³	30.49 ⁴⁷	56.63 ²⁷⁶
	254	33	199	229	296	89	37	307
30.6	6.340	8.23	27.120	64.60	18.958	31.02	30.86	59.70
June 9.6	6.560 ²²⁰	8.68 ⁴⁵	27.286 ¹⁶⁶	67.00 ²⁴⁰	19.213 ²⁵⁵	32.08 ¹⁰⁶	31.11 ²⁵	62.96 ³²⁶
19.5	6.741 ¹⁸¹	9.23 ⁵⁵	27.416 ¹³⁰	69.45 ²⁴⁵	19.421 ²⁰⁸	33.26 ¹¹⁸	31.23 ¹²	66.34 ³³⁸
29.5	6.876 ¹³⁵	9.87 ⁶⁴	27.507 ⁹¹	71.87 ²⁴²	19.577 ¹⁵⁶	34.55 ¹²⁹	31.23 ⁰	69.72 ³³⁸
July 9.5	6.964 ⁸⁸	10.58 ⁷¹	27.554 ⁴⁷	74.19 ²³²	19.675 ⁹⁸	35.90 ¹³⁵	31.10 ¹³	73.03 ³³¹
	38	76	5	217	39	138	25	315
19.4	7.002	11.34	27.559	76.36	19.714	37.28	30.85	76.18
29.4	6.990 ¹²	12.11 ⁷⁷	27.520 ³⁹	78.34 ¹⁹⁸	19.693 ²¹	38.64 ¹³⁶	30.48 ³⁷	79.06 ²⁸⁸
Aug. 8.4	6.927 ⁶³	12.86 ⁷⁵	27.443 ⁷⁷	80.07 ¹⁷³	19.615 ⁷⁸	39.93 ¹²⁹	30.01 ⁴⁷	81.68 ²⁶²
18.4	6.819 ¹⁰⁸	13.58 ⁷²	27.323 ¹²⁰	81.54 ¹⁴⁷	19.481 ¹³⁴	41.11 ¹¹⁸	29.44 ⁵⁷	83.91 ²²³
28.3	6.671 ¹⁴⁸	14.19 ⁶¹	27.171 ¹⁵²	82.70 ¹¹⁶	19.303 ¹⁷⁸	42.11 ¹⁰⁰	28.78 ⁶⁶	85.75 ¹⁸⁴
	183	50	178	84	220	79	71	138
Sept. 7.3	6.488	14.69	26.993	83.54	19.083	42.90	28.07	87.13
17.3	6.283 ²⁰⁵	15.05 ³⁶	26.795 ¹⁹⁸	84.04 ⁵⁰	18.836 ²⁴⁷	43.43 ⁵³	27.30 ⁷⁷	88.01 ⁸⁸
27.3	6.066 ²¹⁷	15.23 ¹⁸	26.586 ²⁰⁹	84.18 ¹⁴	18.573 ²⁶³	43.70 ²⁷	26.51 ⁷⁹	88.38 ³⁷
Oct. 7.2	5.847 ²¹⁹	15.26 ³	26.377 ²⁰⁹	83.97 ²¹	18.309 ²⁶⁴	43.67 ³	25.71 ⁸⁰	88.25 ¹³
17.2	5.640 ²⁰⁷	15.09 ¹⁷	26.177 ²⁰⁰	83.38 ⁵⁹	18.058 ²⁵¹	43.36 ³¹	24.93 ⁷⁸	87.56 ⁶⁹
	183	33	182	92	225	61	75	126
27.2	5.457 ¹⁵⁰	14.76 ⁴⁷	25.995 ¹⁵⁵	82.46 ¹³⁰	17.833 ¹⁸⁶	42.75 ⁸⁴	24.18 ⁶⁹	86.30 ¹⁷³
Nov. 6.1	5.307 ¹⁰⁶	14.29 ⁵⁹	25.840 ¹¹⁸	81.16 ¹⁶²	17.647 ¹³⁶	41.91 ¹⁰⁷	23.49 ⁶¹	84.57 ²²³
16.1	5.201 ⁵⁶	13.70 ⁶⁸	25.722 ⁸⁰	79.54 ¹⁹³	17.511 ⁷⁷	40.84 ¹²⁴	22.88 ⁵⁰	82.34 ²⁸⁷
26.1	5.145 ³	13.02 ⁷³	25.642 ³³	77.61 ²¹⁸	17.434 ¹⁵	39.60 ¹³⁴	22.38 ⁴⁰	79.67 ³⁰⁷
Dec. 6.1	5.142 ⁵³	12.30 ⁷²	25.609 ¹²	75.43 ²⁴⁰	17.419 ⁴⁹	38.26 ¹⁴¹	21.98 ²⁶	76.60 ³³⁵
16.0	5.195	11.57	25.621	73.03	17.468	36.85	21.72	73.25
26.0	5.303 ¹⁰⁸	10.87 ⁷⁰	25.681 ⁶⁰	70.49 ²⁵⁴	17.583 ¹¹⁵	35.44 ¹⁴¹	21.59 ¹³	69.70 ³⁵⁵
36.0	5.460 ¹⁵⁷	10.21 ⁶⁶	25.787	67.88 ²⁶¹	17.759 ¹⁷⁶	34.08 ¹³⁶	21.60 ¹	66.05 ³⁶⁵
Mean Place	3.643	20.40	24.977	60.63	15.864	45.06	26.878	58.97
Sec δ, Tan δ	1.212	-0.685	1.077	+0.399	1.440	-1.036	3.363	+3.211
Dψα, Dωα	+0.079	+0.004	+0.051	-0.002	+0.089	+0.006	-0.024	-0.021
Dψδ, Dωδ	+0.03	-1.00	+0.04	-1.00	+0.04	-1.00	+0.04	-1.00

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Sagittarii. Mag. 2.9		ϵ Serpentis. Mag. 5.4		1 Aquilæ. Mag. 4.1		ζ Pavonis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 23 s	° ' " -25 27 "	h m 18 25 s	° ' " - 2 1 "	h m 18 30 s	° ' " - 8 17 "	h m 18 33 s	° ' " -71 29 "
Jan. 1.0	11.502	47.82	39.083	62.37	59.536	48.50	57.79	38.12
11.0	11.669 ¹⁶⁷	47.71	39.223 ¹⁴⁰	63.68 ¹³¹	59.676 ¹⁴⁰	49.44 ⁹⁴	58.12 ³³	35.43 ²⁶⁹
20.9	11.874 ²⁰⁵	47.64	39.400 ¹⁷⁷	64.97 ¹²⁹	59.851 ¹⁷⁵	50.38 ⁹⁴	58.56 ⁴⁴	32.87 ²⁵⁶
30.9	12.109 ²³⁵	47.60	39.605 ²⁰⁵	66.16 ¹¹⁹	60.056 ²⁰⁵	51.24 ⁸⁶	59.12 ⁵⁶	30.56 ²³¹
Feb. 9.9	12.373 ²⁶⁴	47.57	39.834 ²²⁹	67.22 ¹⁰⁶	60.286 ²³⁰	52.00 ⁷⁶	59.77 ⁶⁵	28.49 ²⁰⁷
19.9	12.655 ²⁸²	47.53	40.082 ²⁴⁸	68.10 ⁸⁸	60.536 ²⁵⁰	52.62 ⁶²	60.47 ⁷⁰	26.72 ¹⁷⁷
Mar. 1.8	12.953 ²⁹⁸	47.47	40.347 ²⁶⁵	68.73 ⁶³	60.804 ²⁶⁸	53.06 ⁴⁴	61.24 ⁷⁷	25.30 ¹⁴²
11.8	13.263 ³¹⁰	47.37	40.622 ²⁷⁵	69.11 ³⁸	61.082 ²⁷⁸	53.26 ²⁰	62.06 ⁸²	24.23 ¹⁰⁷
21.8	13.577 ³¹⁴	47.22	40.902 ²⁸⁰	69.20 ⁹	61.368 ²⁸⁶	53.27 ¹	62.89 ⁸⁵	23.55 ⁶⁸
31.7	13.894 ³¹⁷	47.03	41.186 ²⁸⁴	69.01 ¹⁹	61.657 ²⁸⁹	53.06 ²¹	63.74 ⁸⁵	23.25 ³⁰
Apr. 10.7	14.210 ³¹⁶	46.80	41.468 ²⁸²	68.52 ⁴⁹	61.945 ²⁸⁸	52.64 ⁴²	64.58 ⁸⁴	23.34 ⁹
20.7	14.519 ³⁰⁹	46.55	41.745 ²⁷⁷	67.80 ⁷²	62.229 ²⁸⁴	51.99 ⁶⁵	65.41 ⁸³	23.82 ⁴⁸
30.7	14.817 ²⁹⁸	46.30	42.011 ²⁶⁶	66.86 ⁹¹	62.501 ²⁷²	51.20 ⁷⁹	66.20 ⁷⁹	24.70 ⁸⁸
May 10.6	15.102 ²⁸⁵	46.07	42.266 ²⁵⁵	65.75 ¹¹¹	62.763 ²⁶²	50.32 ⁸⁸	66.94 ⁷⁴	25.89 ¹¹⁹
20.6	15.365 ²⁶³	45.88	42.499 ²³³	64.50 ¹²⁵	63.008 ²⁴⁵	49.34 ⁹⁸	67.61 ⁶⁷	27.44 ¹⁵⁵
30.6	15.604 ²³⁹	45.74	42.710 ²¹¹	63.18 ¹³²	63.226 ²¹⁸	48.32 ¹⁰²	68.21 ⁶⁰	29.29 ¹⁸⁵
June 9.6	15.810 ²⁰⁶	45.68	42.892 ¹⁸²	61.85 ¹³³	63.420 ¹⁹⁴	47.28 ¹⁰⁴	68.72 ⁵¹	31.37 ²⁰⁸
19.5	15.981 ¹⁷¹	45.69	43.042 ¹⁵⁰	60.52 ¹³³	63.577 ¹⁵⁷	46.30 ⁹⁸	69.12 ⁴⁰	33.70 ²³³
29.5	16.111 ¹³⁰	45.79	43.154 ¹¹²	59.24 ¹²⁸	63.700 ¹²³	45.38 ⁹²	69.40 ²⁸	36.15 ²⁴⁵
July 9.5	16.197 ⁸⁶	45.97	43.227 ⁷³	58.07 ¹¹⁷	63.781 ⁸¹	44.54 ⁸⁴	69.58 ¹⁸	38.70 ²⁵⁵
19.4	16.238 ⁴¹	46.23	43.258 ³¹	57.00 ¹⁰⁷	63.823 ⁴²	43.82 ⁷²	69.62 ⁴	41.26 ²⁵⁶
29.4	16.232 ⁶	46.53	43.247 ¹¹	56.07 ⁹³	63.819 ⁴	43.20 ⁶²	69.53 ⁹	43.73 ²⁴⁷
Aug. 8.4	16.180 ⁵²	46.87	43.197 ⁵⁰	55.28 ⁷⁹	63.774 ⁴⁵	42.70 ⁵⁰	69.32 ²¹	46.07 ²³⁴
18.4	16.086 ⁹⁴	47.23	43.108 ⁸⁹	54.65 ⁶³	63.691 ⁸³	42.31 ³⁹	69.01 ³¹	48.20 ²¹³
28.3	15.953 ¹³³	47.56	42.985 ¹²³	54.18 ⁴⁷	63.570 ¹²¹	42.05 ²⁶	68.58 ⁴³	49.98 ¹⁷⁸
Sept. 7.3	15.790 ¹⁶³	47.86	42.834 ¹⁵¹	53.85 ³³	63.424 ¹⁴⁶	41.91 ¹⁴	68.08 ⁵⁰	51.42 ¹⁴⁴
17.3	15.604 ¹⁸⁶	48.09	42.664 ¹⁷⁰	53.69 ¹⁶	63.254 ¹⁷⁰	41.86 ⁵	67.50 ⁵⁸	52.43 ¹⁰¹
27.3	15.407 ¹⁹⁷	48.26	42.482 ¹⁸²	53.39 ⁰	63.073 ¹⁸¹	41.92 ⁶	66.89 ⁶¹	52.98 ⁵⁵
Oct. 7.2	15.208 ¹⁹⁹	48.34	42.299 ¹⁸³	53.83 ¹⁴	62.889 ¹⁸⁴	42.07 ¹⁵	66.27 ⁶²	52.98 ⁰
17.2	15.018 ¹⁹⁰	48.33	42.124 ¹⁷⁵	54.13 ³⁰	62.715 ¹⁷⁴	42.31 ²⁴	65.67 ⁶⁰	52.51 ⁴⁷
27.2	14.851 ¹⁶⁷	48.25	41.967 ¹⁵⁷	54.59 ⁴⁶	62.556 ¹⁵⁹	42.63 ³²	65.11 ⁵⁶	51.52 ⁹⁹
Nov. 6.1	14.714 ¹³⁷	48.10	41.838 ¹²⁹	55.21 ⁶²	62.425 ¹³¹	43.07 ⁴⁴	64.62 ⁴⁹	50.06 ¹⁴⁶
16.1	14.616 ⁹⁸	47.91	41.742 ⁹⁶	55.99 ⁷⁸	62.324 ¹⁰¹	43.60 ⁵³	64.22 ⁴⁰	48.21 ¹⁸⁵
26.1	14.563 ⁵³	47.70	41.686 ⁵⁶	56.91 ⁹²	62.267 ⁵⁷	44.23 ⁶³	63.94 ²⁸	46.01 ²²⁰
Dec. 6.1	14.559 ⁴	47.49	41.674 ¹²	57.98 ¹⁰⁷	62.253 ¹⁴	44.96 ⁷³	63.79 ¹⁵	43.55 ²⁴⁶
16.0	14.605 ⁴⁶	47.30	41.706 ³²	59.17 ¹¹⁹	62.285 ³²	45.80 ⁸⁴	63.77 ²	40.91 ²⁶⁴
26.0	14.702 ⁹⁷	47.15	41.782 ⁷⁶	60.44 ¹²⁷	62.359 ⁷⁴	46.69 ⁸⁹	63.89 ¹²	38.20 ²⁷¹
36.0	14.842 ¹⁴⁰	47.04	41.901 ¹¹⁹	61.78 ¹³⁴	62.479 ¹²⁰	47.62 ⁹³	64.14 ²⁵	35.49 ²⁷¹
Mean Place	13.127	56.76	40.524	70.62	61.007	56.80	62.540	47.57
Sec δ , Tan δ	1.108	-0.476	1.001	-0.036	1.011	-0.146	3.150	-2.988
$D\psi\alpha$, $D\omega\alpha$	+0.074	+0.003	+0.062	0.000	+0.065	+0.001	+0.140	+0.029
$D\psi\delta$, $D\omega\delta$	+0.04	-0.99	+0.04	-0.99	+0.05	-0.99	+0.06	-0.99

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Lyrae. (Vega.) Mag. 0.1		ϵ Aquilæ. Mag. 4.7		ϕ Sagittarii. Mag. 3.3		η Herculis. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 34 s	° ' " +38 42 "	h m 18 38 s	° ' " - 9 7 "	h m 18 40 s	° ' " -27 4 "	h m 18 42 s	° ' " +20 28 "
Jan. 1.0	18.169	48.46	2.058	30.77	49.075	8.49	19.332	25.79
11.0	18.273 ¹⁰⁴	45.30 ³¹⁶	2.192 ¹³⁴	31.62 ⁸⁵	49.225 ¹⁵⁰	8.20 ²⁹	19.441 ¹⁰⁹	23.32 ²⁴⁷
20.9	18.427 ¹⁵⁴	42.22 ³⁰⁸	2.363 ¹⁷¹	32.45 ⁸³	49.414 ¹⁸⁹	7.94 ²⁶	19.588 ¹⁴⁷	20.91 ²⁴¹
30.9	18.626 ¹⁹⁹	39.34 ²⁸⁸	2.561 ¹⁹⁸	33.23 ⁷⁸	49.637 ²²³	7.70 ²⁴	19.769 ¹⁸¹	18.66 ²²⁵
Feb. 9.9	18.860 ²³⁴	36.77 ²⁵⁷	2.788 ²²⁷	33.91 ⁶⁸	49.889 ²⁵²	7.47 ²³	19.981 ²¹²	16.63 ²⁰³
19.9	19.129 ²⁶⁹	34.57 ²²⁰	3.034 ²⁴⁶	34.46 ⁵⁵	50.164 ²⁷⁵	7.24 ²³	20.219 ²³⁸	14.93 ¹⁷⁰
Mar. 1.8	19.425 ²⁹⁶	32.91 ¹⁶⁶	3.298 ²⁶¹	34.84 ³⁸	50.457 ²⁹³	6.99 ²⁵	20.476 ²⁵⁷	13.61 ¹³²
11.8	19.739 ³¹⁴	31.78 ¹¹³	3.574 ²⁷⁶	35.01 ¹⁷	50.763 ³⁰⁶	6.70 ²⁹	20.749 ²⁷³	12.74 ⁸⁷
21.8	20.067 ³²⁸	31.25 ⁵³	3.859 ²⁸⁵	34.97 ⁴	51.079 ³¹⁶	6.40 ³⁰	21.033 ²⁸⁴	12.34 ⁴⁰
31.8	20.399 ³³²	31.29 ⁴	4.148 ²⁸⁹	34.73 ²⁴	51.400 ³²¹	6.06 ³⁴	21.322 ²⁸⁹	12.44 ¹⁰
Apr. 10.7	20.729 ³³⁰	31.95 ⁶⁶	4.437 ²⁸⁹	34.27 ⁴⁶	51.722 ³²²	5.70 ³⁶	21.613 ²⁹¹	13.01 ⁵⁷
20.7	21.052 ³²³	33.16 ¹²¹	4.722 ²⁸⁵	33.62 ⁶⁵	52.040 ³¹⁸	5.34 ³⁶	21.900 ²⁸⁷	14.01 ¹⁰⁰
30.7	21.358 ³⁰⁶	34.87 ¹⁷¹	4.999 ²⁷⁷	32.82 ⁸⁰	52.352 ³¹²	5.00 ³¹	22.177 ²⁷⁷	15.42 ¹⁴¹
May 10.6	21.641 ²⁸³	37.02 ²¹⁵	5.264 ²⁶⁵	31.91 ⁹¹	52.649 ²⁹⁷	4.69 ³¹	22.439 ²⁶²	17.18 ¹⁷⁶
20.6	21.901 ²⁶⁰	39.49 ²⁴⁷	5.513 ²¹⁹	30.92 ⁹⁹	52.928 ²⁷⁹	4.44 ²⁵	22.681 ²¹²	19.21 ²⁰³
30.6	22.121 ²²⁰	42.27 ²⁷⁸	5.740 ²²⁷	29.90 ¹⁰²	53.184 ²⁵⁶	4.27 ¹⁷	22.899 ²¹⁸	21.45 ²²⁴
June 9.6	22.303 ¹⁸²	45.23 ²⁹⁶	5.939 ¹⁹⁹	28.89 ¹⁰¹	53.409 ²²⁵	4.19 ⁸	23.086 ¹⁸⁷	23.82 ²³⁷
19.5	22.442 ¹³⁹	48.30 ³⁰⁷	6.105 ¹⁶⁶	27.91 ⁹⁸	53.601 ¹⁹²	4.23 ⁴	23.237 ¹⁵¹	26.25 ²⁴³
29.5	22.533 ⁹⁴	51.35 ³⁰⁵	6.235 ¹³⁰	27.00 ⁹¹	53.751 ¹⁵⁰	4.35 ¹²	23.347 ¹¹⁰	28.65 ²⁴⁰
July 9.5	22.572 ³⁹	54.32 ²⁹⁷	6.324 ⁸⁹	26.17 ⁸³	53.856 ¹⁰⁵	4.57 ²²	23.418 ⁷¹	30.99 ²³⁴
19.5	22.564 ⁸	57.16 ²⁸⁴	6.370 ¹⁶	25.47 ⁷⁰	53.915 ⁵⁹	4.89 ³²	23.444 ²⁶	33.20 ²²¹
29.4	22.503 ⁶¹	59.79 ²⁶³	6.374 ⁴	24.88 ⁵⁹	53.925 ¹⁰	5.28 ³⁹	23.427 ¹⁷	35.23 ²⁰³
Aug. 8.4	22.396 ¹⁰⁷	62.15 ²³⁶	6.336 ³⁸	24.41 ⁴⁷	53.888 ³⁷	5.71 ⁴³	23.365 ⁶²	37.03 ¹⁸⁰
18.4	22.245 ¹⁵¹	64.19 ²⁰⁴	6.257 ⁷⁹	24.07 ³⁴	53.806 ⁸²	6.17 ⁴⁶	23.264 ¹⁰¹	38.59 ¹⁵⁶
28.3	22.050 ¹⁹⁵	65.85 ¹⁶⁶	6.143 ¹¹¹	23.83 ²¹	53.683 ¹²³	6.62 ⁴⁵	23.128 ¹³⁶	39.84 ¹²⁵
Sept. 7.3	21.828 ²²²	67.12 ¹²⁷	5.998 ¹⁴⁵	23.71 ¹²	53.528 ¹⁵⁵	7.03 ⁴¹	22.962 ¹⁶⁶	40.79 ⁹⁵
17.3	21.580 ²⁴⁸	67.99 ⁸⁷	5.832 ¹⁶⁶	23.68 ³	53.346 ¹⁸²	7.39 ³⁶	22.773 ¹⁸⁹	41.40 ⁶¹
27.3	21.318 ²⁶²	68.38 ³⁹	5.652 ¹⁸⁰	23.74 ⁶	53.149 ¹⁹⁷	7.65 ²⁶	22.570 ²⁰³	41.69 ²⁹
Oct. 7.2	21.053 ²⁶⁵	68.32 ⁶	5.469 ¹⁸³	23.89 ¹⁵	52.947 ²⁰²	7.82 ¹⁷	22.363 ²⁰⁷	87.56 ⁶⁹
17.2	20.793 ²⁶⁰	67.79 ⁵³	5.292 ¹⁷⁷	24.12 ²³	52.753 ¹⁹¹	7.87 ⁵	22.193 ⁷⁸	87.56 ¹²⁶
27.2	20.552 ²⁴¹	66.78 ¹⁰¹	5.131 ¹⁶¹	24.42 ³⁰	52.576 ¹⁷⁷	7.83 ⁴	21.918 ⁷⁵	86.30 ⁶⁹
Nov. 6.2	20.336 ²¹⁶	65.34 ¹¹¹	4.996 ¹³⁵	24.82 ⁴⁰	52.427 ¹⁴⁹	7.69 ¹⁴	21.811 ⁶⁹	84.57 ¹⁷³
16.1	20.161 ¹⁷⁵	63.42 ¹⁹²	4.894 ¹⁰²	25.30 ⁴⁸	52.314 ¹¹³	7.48 ²¹	21.681 ¹³⁰	82.34 ²²³
26.1	20.023 ¹³⁸	61.14 ²²⁸	4.833 ⁶¹	25.88 ⁵⁸	52.246 ⁶⁸	7.22 ²⁶	21.587 ⁹⁴	36.10 ²⁸⁷
Dec. 6.1	19.938 ⁸⁵	58.54 ²⁶⁰	4.812 ²¹	26.56 ⁶⁸	52.225 ²⁷	6.93 ²⁹	21.535 ⁵²	34.08 ³⁰⁷
16.0	19.905 ³³	55.63 ²⁹¹	4.837 ²⁵	27.32 ⁷⁶	52.252 ²⁷	6.64 ²⁹	21.530 ⁵	31.83 ²²⁵
26.0	19.923 ¹⁸	52.53 ³¹⁰	4.907 ⁷⁰	28.13 ⁸¹	52.330 ⁷⁸	6.35 ²⁹	21.569 ³⁹	29.42 ²⁴¹
36.0	19.997 ⁷⁴	49.34 ³¹⁹	5.019 ¹¹²	28.99 ⁸⁶	52.455 ¹²⁵	6.08 ²⁷	21.651 ⁸²	26.93 ²⁴⁹
Mean Place	19.884	40.19	3.536	38.89	50.755	16.61	20.803	17.49
Sec δ , Tan δ	1.282	+0.802	1.013	-0.161	1.123	-0.511	1.067	+0.373
$D\psi\alpha$, $D\omega\alpha$	+0.040	-0.008	+0.065	+0.002	+0.075	+0.006	+0.051	-0.005
$D\psi\delta$, $D\omega\delta$	+0.06	-0.99	+0.07	-0.99	+0.07	-0.98	+0.07	-0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	6 Aquilæ. Mag. 4.5		λ Pavonis. Mag. 4.4		β Lyræ. Var. 3.4-4.1		50 Draconis. Mag. 5.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 43	° / - 4 49	h m 18 45	° / -62 16	h m 18 47	° / +33 16	h m 18 48	° / +75 20
	s	"	s	"	s	"	s	"
Jan. 1.0	3.873	45.28	1.87	31.56	12.613	29.35	47.25	46.94
11.0	3.999 ¹²⁶	46.37 ¹⁰⁹	2.10 ²³	29.24 ²³²	12.706 ⁹³	26.36 ²⁹⁹	47.25 ⁰	43.39 ³⁵⁵
21.0	4.161 ¹⁸²	47.44 ¹⁰⁷	2.40 ³⁰	27.02 ²²²	12.843 ¹³⁷	23.47 ²⁸⁹	47.42 ¹⁷	39.86 ³⁵³
30.9	4.353 ¹⁹²	48.44 ¹⁰⁰	2.78 ³⁸	24.94 ²⁰⁸	13.024 ¹⁸¹	20.72 ²⁷⁵	47.75 ³³	36.49 ³³⁷
Feb. 9.9	4.570 ²¹⁷	49.33 ⁸⁹	3.22 ⁴⁴	23.08 ¹⁸⁶	13.237 ²¹³	18.26 ²⁴⁶	48.23 ⁴⁸	33.45 ³⁰¹
	240	71	49	165	247	210	61	266
19.9	4.810	50.04	3.71	21.43	13.484	16.16	48.84	30.79
Mar. 1.8	5.066 ²⁵⁶	50.54 ⁵⁰	4.24 ⁵³	20.06 ¹³⁷	13.758 ²⁷⁴	14.48 ¹⁶⁸	49.56 ⁷²	28.63 ²¹⁶
11.8	5.336 ²⁷⁰	50.81 ²⁷	4.80 ⁵⁶	18.97 ¹⁰⁹	14.052 ²⁹⁴	13.35 ¹¹³	50.37 ⁸¹	27.07 ¹⁵⁶
21.8	5.615 ²⁷⁹	50.82 ¹	5.37 ⁵⁷	18.19 ⁷⁸	14.357 ³⁰⁵	12.77 ⁵⁸	51.23 ⁸⁶	26.13 ⁹⁴
31.8	5.899 ²⁸⁴	50.58 ²⁴	5.96 ⁵⁹	17.71 ⁴⁸	14.672 ³¹⁵	12.76 ¹	52.12 ⁸⁹	25.84 ²⁹
	286	50	59	15	315	55	89	39
Apr. 10.7	6.185	50.08	6.55	17.56	14.987	13.31	53.01	26.23
20.7	6.468 ²⁸³	49.35 ⁷³	7.13 ⁵⁸	17.72 ¹⁶	15.296 ³⁰⁹	14.39 ¹⁰⁸	53.87 ⁸⁶	27.23 ¹⁰⁰
30.7	6.744 ²⁷⁶	48.45 ⁹⁰	7.69 ⁵⁶	18.22 ⁵⁰	15.595 ²⁹⁹	15.96 ¹⁵⁷	54.67 ⁸⁰	28.81 ¹⁵⁸
May 10.7	7.008 ²⁶⁴	47.38 ¹⁰⁷	8.23 ⁵⁴	19.03 ⁸¹	15.875 ²⁸⁰	17.94 ¹⁹⁸	55.38 ⁷¹	30.94 ²¹³
20.6	7.257 ²⁴⁹	46.19 ¹¹⁹	8.72 ⁴⁹	20.14 ¹¹¹	16.136 ²⁶¹	20.28 ²³⁴	56.00 ⁶²	33.49 ²⁵⁵
	225	124	45	137	226	261	49	291
30.6	7.482	44.95	9.17	21.51	16.362	22.89	56.49	36.40
June 9.6	7.681 ¹⁹⁹	43.70 ¹²⁵	9.56 ³⁹	23.15 ¹⁶⁴	16.554 ¹⁹²	25.69 ²⁸⁰	56.85 ³⁶	39.57 ³¹⁷
19.5	7.848 ¹⁶⁷	42.48 ¹²²	9.88 ³²	25.01 ¹⁸⁶	16.708 ¹⁵⁴	28.56 ²⁸⁷	57.07 ²²	42.91 ³³¹
29.5	7.978 ¹³⁰	41.31 ¹¹⁷	10.12 ²⁴	27.03 ²⁰²	16.816 ¹⁰⁸	31.47 ²⁹¹	57.14 ⁷	46.33 ³⁴²
July 9.5	8.069 ⁹¹	40.24 ¹⁰⁷	10.28 ¹⁶	29.15 ²¹²	16.877 ⁶¹	34.32 ²⁸⁵	57.06 ⁸	49.73 ³⁴⁰
	47	95	8	216	14	272	23	340
19.5	8.116 ⁶	39.29	10.36	31.31	16.891	37.04	56.83	53.03
29.4	8.122 ⁶	38.45 ⁸⁴	10.34 ²	33.47 ²¹⁶	16.857 ³⁴	39.57 ²⁵³	56.46 ³⁷	56.15 ³¹²
Aug. 8.4	8.087 ³⁵	37.77 ⁶⁸	10.24 ¹⁰	35.55 ²⁰⁸	16.778 ⁷⁹	41.86 ²²⁹	55.96 ⁵⁰	58.99 ²⁸⁴
18.4	8.010 ⁷⁷	37.23 ⁵¹	10.06 ¹⁸	37.44 ¹⁸⁹	16.652 ¹²⁶	43.86 ²⁰⁰	55.34 ⁶²	61.56 ²⁵⁷
28.4	7.898 ¹¹²	36.84 ³⁹	9.80 ²⁶	39.10 ¹⁶⁶	16.489 ¹⁶³	45.50 ¹⁶⁴	54.62 ⁷²	63.75 ²¹⁹
	142	26	32	138	198	128	81	174
Sept. 7.3	7.756	36.58	9.48	40.48	16.291	46.78	53.81	65.49
17.3	7.592 ¹⁶⁴	36.46 ¹²	9.11 ³⁷	41.51 ¹⁰³	16.071 ²²⁰	47.70 ⁹²	52.93 ⁸⁸	66.82 ¹³³
27.3	7.413 ¹⁷⁹	36.48 ²	8.71 ⁴⁰	42.12 ⁶¹	15.835 ²³⁶	48.17 ⁴⁷	52.00 ⁹³	67.61 ⁷⁹
Oct. 7.2	7.230 ¹⁸³	36.62 ¹⁴	8.30 ⁴¹	42.31 ¹⁹	15.593 ²¹²	48.20 ³	51.05 ⁹⁵	67.92 ³¹
17.2	7.054 ¹⁷⁶	36.88 ²⁶	7.90 ⁴⁰	42.05 ²⁶	15.355 ²³⁸	47.80 ⁴⁰	50.10 ⁹⁵	67.67 ²⁵
	163	38	38	69	221	85	91	80
27.2	6.891	37.26	7.52	41.36	15.131	46.95	49.19	66.87
Nov. 6.2	6.754 ¹³⁷	37.78 ⁵²	7.19 ³³	40.24 ¹¹²	14.933 ¹⁹⁸	45.68 ¹²⁷	48.32 ⁸⁷	65.54 ¹³³
16.1	6.649 ¹⁰⁵	38.42 ⁶⁴	6.93 ²⁶	38.75 ¹⁴⁹	14.765 ¹⁶⁸	43.97 ¹⁷¹	47.53 ⁷⁹	63.70 ¹⁸⁴
26.1	6.582 ⁶⁷	39.19 ⁷⁷	6.74 ¹⁹	36.96 ¹⁷⁹	14.636 ¹²⁹	41.93 ²⁰⁴	46.84 ⁶⁹	61.36 ²³⁴
Dec. 6.1	6.555 ²⁷	40.09 ⁹⁰	6.64 ¹⁰	34.92 ²⁰⁴	14.553 ⁸³	39.55 ²³⁸	46.28 ⁵⁶	58.62 ²⁷⁴
	19	96	0	221	34	267	43	312
16.1	6.574	41.05	6.64	32.71	14.519	36.88	45.85	55.50
26.0	6.634 ⁶⁰	42.12 ¹⁰⁷	6.72 ⁸	30.40 ²³¹	14.532 ¹³	34.01 ²⁸⁷	45.58 ²⁷	52.12 ³³⁸
36.0	6.738 ¹⁰⁴	43.23 ¹¹¹	6.90 ¹⁸	28.08 ²³²	14.597 ⁶⁵	31.02 ²⁹⁹	45.47 ¹¹	48.58 ³⁵⁴
Mean Place	5.328	53.31	5.174	39.81	14.207	20.63	52.048	36.92
Sec δ, Tan δ	1.004	-0.085	2.150	-1.903	1.196	+0.656	3.953	+3.824
Dψα, Dωα	+0.063	+0.001	+0.111	+0.025	+0.044	-0.009	-0.038	-0.054
Dψδ, Dωδ	+0.07	-0.98	+0.08	-0.98	+0.08	-0.98	+0.08	-0.98

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Draconis. Mag. 4.8		σ Sagittarii. Mag. 2.1		θ Serpentis pr. Mag. 4.5		β Lyrae. Var. 4.0-4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 18 50	° ' +59 17	h m 18 50	° ' -26 23	h m 18 52	° ' + 4 6	h m 18 52	° ' +43 50
	s "	"	s "	"	s "	"	s "	"
Jan. 1.0	1.613	47.56	27.752	30.27	22.050	16.18	57.759	47.48
11.0	1.670 ⁵⁷	44.00 ³⁵⁶	27.891 ¹³⁹	30.02 ²⁵	22.160 ¹¹⁰	14.59 ¹⁵⁹	57.836 ⁷⁷	44.20 ³²⁸
21.0	1.808 ¹³⁸	40.51 ³⁴⁹	28.068 ¹⁷⁷	29.76 ²⁶	22.307 ¹⁴⁷	13.04 ¹⁵⁵	57.965 ¹²⁹	40.97 ³²³
30.9	2.019 ²¹¹	37.17 ³³⁴	28.280 ²¹²	29.52 ²⁴	22.485 ¹⁷⁸	11.57 ¹⁴⁷	58.144 ¹⁷⁹	37.91 ³⁰⁶
Feb. 9.9	2.299 ²⁸⁰	34.16 ³⁰¹	28.523 ²⁴³	29.24 ²⁸	22.689 ²⁰⁴	10.29 ¹²⁸	58.369 ²²⁵	35.14 ²⁷⁷
	341 ²⁶²	262	265	26	229	107	264	239
19.9	2.640	31.54	28.788	28.98	22.918	9.22	58.633	32.75
Mar. 1.8	3.033 ³⁹³	29.43 ²¹¹	29.075 ²⁸⁷	28.67 ³¹	23.164 ²⁴⁶	8.42 ⁸⁰	58.930 ²⁹⁷	30.84 ¹⁹¹
11.8	3.461 ⁴²⁸	27.92 ¹⁵¹	29.376 ³⁰¹	28.34 ³³	23.426 ²⁶²	7.93 ⁴⁹	59.252 ³²²	29.48 ¹³⁶
21.8	3.917 ⁴⁵⁶	27.05 ⁸⁷	29.686 ³¹⁰	27.97 ³⁷	23.698 ²⁷²	7.79 ¹⁴	59.592 ³⁴⁰	28.73 ⁷⁵
31.8	4.388 ⁴⁷¹	26.83 ⁴⁵	30.003 ³¹⁷	27.55 ⁴²	23.979 ²⁸¹	7.99 ²⁰	59.944 ³⁵²	28.59 ¹⁴
	471	45	321	42	282	54	353	48
Apr. 10.7	4.859	27.28	30.324	27.13	24.261	8.53	60.297	29.07
20.7	5.319 ⁴⁶⁰	28.35 ¹⁰⁷	30.643 ³¹⁹	26.66 ⁴⁷	24.543 ²⁸²	9.37 ⁸⁴	60.645 ³⁴⁸	30.14 ¹⁰⁷
30.7	5.754 ⁴³⁵	30.01 ¹⁶⁶	30.957 ³¹⁴	26.24 ⁴²	24.817 ²⁷¹	10.50 ¹¹³	60.979 ³³⁴	31.74 ¹⁶⁰
May 10.7	6.154 ⁴⁰⁰	32.17 ²¹⁶	31.259 ³⁰²	25.84 ⁴⁰	25.081 ²⁶⁴	11.84 ¹³⁴	61.292 ³¹³	33.82 ²⁰⁸
20.6	6.507 ³⁵³	34.78 ²⁶¹	31.542 ²⁸³	25.52 ³²	25.330 ²¹⁹	13.36 ¹⁵²	61.577 ²⁸⁵	36.29 ²⁴⁷
	298	297	262	29	227	165	250	281
30.6	6.805	37.75	31.804	25.23	25.557	15.01	61.827	39.10
June 9.6	7.043 ²³⁸	40.96 ³²¹	32.035 ²³¹	25.07 ¹⁶	25.757 ²⁰⁰	16.71 ¹⁷⁰	62.035 ²⁰⁸	42.12 ³⁰²
19.5	7.211 ¹⁶⁸	44.32 ³³⁶	32.235 ²⁰⁰	25.00 ⁷	25.925 ¹⁶⁸	18.44 ¹⁷³	62.195 ¹⁶⁰	45.29 ³¹⁷
29.5	7.306 ⁹⁵	47.75 ³¹³	32.391 ¹⁵⁶	25.07 ⁷	26.058 ¹³³	20.11 ¹⁶⁷	62.305 ¹¹⁰	48.48 ³¹⁹
July 9.5	7.325 ¹⁹	51.15 ³⁴⁰	32.505 ¹¹⁴	25.24 ¹⁷	26.150 ⁹²	21.70 ¹⁵⁹	62.359 ⁵⁴	51.67 ³¹⁹
	54	330	67	27	50	147	1	304
19.5	7.271	54.45	32.572	25.51	26.200	23.17	62.360	54.71
29.4	7.143 ¹²⁸	57.55 ³¹⁰	32.593 ²¹	25.85 ³¹	26.208 ⁸	24.48 ¹³¹	62.306 ⁵⁴	57.57 ²⁸⁶
Aug. 8.4	6.942 ²⁰¹	60.38 ²⁸³	32.563 ³⁰	26.27 ⁴²	26.174 ³⁴	25.62 ¹¹⁴	62.200 ¹⁰⁶	60.18 ²⁶¹
18.4	6.679 ²⁶³	62.90 ²⁵²	32.490 ⁷³	26.71 ⁴⁴	26.100 ⁷⁴	26.56 ⁹⁴	62.044 ¹⁵⁶	62.48 ²³⁰
28.4	6.359 ³²⁰	65.03 ²¹³	32.375 ¹¹⁵	27.16 ⁴⁵	25.990 ¹¹⁰	27.32 ⁷⁶	61.844 ²⁰⁰	64.42 ¹⁹⁴
	368	170	147	42	142	54	238	155
Sept. 7.3	5.991	66.73	32.228	27.58	25.848	27.86	61.606	65.97
17.3	5.586 ⁴⁰⁵	67.98 ¹²⁵	32.050 ¹⁷⁸	27.95 ³⁷	25.685 ¹⁶³	28.20 ³⁴	61.342 ²⁶⁴	67.07 ¹¹⁰
27.3	5.157 ⁴²⁹	68.72 ⁷⁴	31.856 ¹⁹⁴	28.27 ³²	25.505 ¹⁸⁰	28.31 ¹¹	61.057 ²⁸⁵	67.72 ⁶⁵
Oct. 7.2	4.717 ⁴⁴⁰	68.94 ²²	31.655 ²⁰¹	28.51 ²⁴	25.321 ¹⁸⁴	28.22 ⁹	60.765 ²⁹²	67.90 ¹⁸
17.2	4.279 ⁴³⁸	68.63 ³¹	31.461 ¹⁹⁴	28.63 ¹²	25.140 ¹⁸¹	27.92 ³⁰	60.476 ²⁸⁹	67.57 ³³
	419	84	178	0	167	51	276	81
27.2	3.860	67.79	31.283	28.63	24.973	27.41	60.200	66.76
Nov. 6.2	3.471 ³⁸⁹	66.40 ¹³⁹	31.130 ¹⁵³	28.59 ⁴	24.827 ¹⁴⁶	26.68 ⁷³	59.950 ²⁵⁰	65.45 ¹³¹
16.1	3.125 ³⁴⁶	64.52 ¹⁸⁸	31.010 ¹²⁰	28.43 ¹⁶	24.712 ¹¹⁵	25.77 ⁹¹	59.733 ²¹⁷	63.67 ¹⁷⁸
26.1	2.836 ²⁸⁹	62.13 ²³⁹	30.937 ⁷³	28.22 ²¹	24.634 ⁷⁸	24.64 ¹¹³	59.558 ¹⁷⁵	61.46 ²²¹
Dec. 6.1	2.610 ²²⁶	59.35 ²⁷⁸	30.905 ³²	27.99 ²³	24.594 ⁴⁰	23.36 ¹²⁸	59.433 ¹²⁵	58.89 ²⁵⁷
	151	313	18	26	3	144	71	292
16.1	2.459	56.22	30.923	27.73	24.597	21.92	59.362	55.97
26.0	2.385 ⁷⁴	52.82 ³⁴⁰	30.990 ⁶⁷	27.47 ²⁶	24.643 ⁴⁶	20.39 ¹⁵³	59.346 ¹⁶	52.82 ³¹⁵
36.0	2.392 ⁷	49.27 ³⁵⁵	31.104 ¹¹⁴	27.20 ²⁷	24.730 ⁸⁷	18.79 ¹⁶⁰	59.387 ⁴¹	49.56 ³²⁶
Mean Place	4.058	37.93	29.433	37.92	23.475	8.11	59.544	38.18
Sec δ, Tan δ	1.958	+1.684	1.116	-0.496	1.003	+0.072	1.387	+0.960
Dψα, Dωα	+0.018	-0.024	+0.074	+0.007	+0.059	-0.001	+0.036	-0.015
Dψδ, Dωδ	+0.09	-0.98	+0.09	-0.98	+0.09	-0.97	+0.09	-0.97

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Lyrae. Mag. 3.3		ϵ Aquilæ. Mag. 4.2		ζ Sagittarii. Mag. 2.7		ζ Aquilæ. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m	° '	h m	° '	h m	° '	h m	° '
	18 56	+32 34	18 56	+14 57	18 57	-29 59	19 1	+13 44
	s	"	s	"	s	"	s	"
Jan. 1.0	2.193	67.80	6.207	53.73	41.039	23.28	50.820	60.91
11.0	2.278 ⁸⁵	64.86 ²⁹⁴	6.306 ⁹⁹	51.58 ²¹⁵	41.173 ¹³⁴	22.76 ⁵²	50.914 ⁹⁴	58.83 ²⁰⁸
21.0	2.404 ¹²⁶	62.00 ²³⁶	6.441 ¹³⁵	49.47 ²¹¹	41.349 ¹⁷⁶	22.25 ⁵¹	51.043 ¹²⁹	56.79 ²⁰⁴
30.9	2.576 ¹⁷²	59.26 ²⁷⁴	6.611 ¹⁷⁰	47.47 ²⁰⁰	41.561 ²¹²	21.75 ⁵⁰	51.209 ¹⁶⁶	54.86 ¹⁹³
Feb. 9.9	2.779 ²⁰³	56.81 ²⁴⁵	6.811 ²⁰⁰	45.67 ¹⁸⁰	41.803 ²⁴²	21.26 ⁴⁹	51.404 ¹⁹⁵	53.14 ¹⁷²
	240	212	224	151	269	49	219	148
19.9	3.019	54.69	7.035	44.16	42.072	20.77	51.623	51.66
Mar. 1.8	3.285 ²⁶⁶	52.99 ¹⁷⁰	7.280 ²⁴⁵	43.00 ¹¹⁶	42.361 ²⁸⁹	20.28 ⁴⁹	51.865 ²⁴²	50.54 ¹¹²
11.8	3.571 ²⁸⁶	51.82 ¹¹⁷	7.542 ²⁶²	42.22 ⁷⁸	42.667 ³⁰⁶	19.79 ⁴⁹	52.124 ²⁵⁹	49.79 ⁷⁵
21.8	3.872 ³⁰¹	51.20 ⁶²	7.816 ²⁷⁴	41.88 ³⁴	42.985 ³¹⁸	19.29 ⁵⁰	52.398 ²⁷⁴	49.45 ³⁴
31.8	4.182 ³¹⁰	51.13 ⁷	8.098 ²⁸²	41.98 ¹⁰	43.311 ³²⁶	18.79 ⁵⁰	52.678 ²⁸⁰	49.54 ⁹
	314	49	286	52	330	49	285	51
Apr. 10.7	4.496	51.62	8.384	42.50	43.641	18.30	52.963	50.05
20.7	4.807 ³¹¹	52.64 ¹⁰²	8.668 ²⁸⁴	43.43 ⁹³	43.972 ³³¹	17.84 ⁴⁶	53.248 ²⁸⁵	50.95 ⁹⁰
30.7	5.108 ³⁰¹	54.14 ¹⁵⁰	8.946 ²⁷⁸	44.73 ¹³⁰	44.297 ³²⁵	17.42 ⁴²	53.528 ²⁸⁰	52.22 ¹²⁷
May 10.7	5.392 ²⁸⁴	56.08 ¹⁹⁴	9.213 ²⁶⁷	46.35 ¹⁶²	44.611 ³¹⁴	17.09 ³³	53.797 ²⁶⁹	53.79 ¹⁵⁷
20.6	5.658 ²⁶⁶	58.37 ²²⁹	9.462 ²⁴⁹	48.20 ¹⁸⁵	44.908 ²⁹⁷	16.84 ²⁵	54.049 ²⁵²	55.63 ¹⁸⁴
	234	256	227	206	276	15	232	199
30.6	5.892	60.93	9.689	50.26	45.184	16.69	54.281	57.62
June 9.6	6.093 ²⁰¹	63.70 ²⁷⁷	9.887 ¹⁹⁸	52.43 ²¹⁷	45.429 ²⁴⁵	16.67 ²	54.483 ²⁰²	59.76 ²¹⁴
19.5	6.256 ¹⁶³	66.55 ²⁸⁵	10.053 ¹⁶⁶	54.64 ²²¹	45.640 ²¹¹	16.78 ¹¹	54.653 ¹⁷⁰	61.93 ²¹⁷
29.5	6.372 ¹¹⁶	69.46 ²⁹¹	10.181 ¹²⁸	56.85 ²²¹	45.811 ¹⁷¹	17.02 ²⁴	54.788 ¹³⁵	64.10 ²¹⁷
July 9.5	6.443 ⁷¹	72.31 ²⁸⁵	10.270 ⁸⁹	58.97 ²¹²	45.936 ¹²⁵	17.37 ³⁵	54.883 ⁹⁵	66.19 ²⁰⁹
	27	273	45	202	77	46	51	197
19.5	6.470	75.04	10.315	60.99	46.013	17.83	54.934	68.16
29.4	6.445 ²⁵	77.59 ²⁵⁵	10.316 ¹	62.84 ¹⁸⁵	46.041 ²⁸	18.38 ⁵⁵	54.940 ⁶	70.00 ¹⁸⁴
Aug. 8.4	6.376 ⁶⁹	79.92 ²³³	10.274 ⁴²	64.48 ¹⁶⁴	46.018 ²³	18.99 ⁶¹	54.905 ³⁵	71.61 ¹⁶¹
18.4	6.259 ¹¹⁷	81.96 ²⁰⁴	10.191 ⁸³	65.90 ¹⁴²	45.948 ⁷⁰	19.62 ⁶³	54.828 ⁷⁷	73.00 ¹³⁹
28.4	6.104 ¹⁵⁵	83.65 ¹⁶⁹	10.072 ¹¹⁹	67.05 ¹¹⁵	45.834 ¹¹⁴	20.25 ⁶³	54.716 ¹¹²	74.13 ¹¹³
	189	137	150	88	151	58	145	89
Sept. 7.3	5.915	85.02	9.922	67.93	45.683	20.83	54.571	75.02
17.3	5.701 ²¹⁴	85.98 ⁹⁶	9.747 ¹⁷⁵	68.52 ⁵⁹	45.504 ¹⁷⁹	21.33 ⁵⁰	54.401 ¹⁷⁰	75.60 ⁵⁸
27.3	5.472 ²²⁹	86.51 ⁵³	9.557 ¹⁹⁰	68.82 ³⁰	45.305 ¹⁹⁹	21.73 ⁴⁰	54.213 ¹⁸⁸	75.91 ³¹
Oct. 7.2	5.233 ²³⁹	86.64 ¹³	9.361 ¹⁹⁶	68.82 ⁰	45.098 ²⁰⁷	21.99 ²⁶	54.020 ¹⁹³	75.91 ⁰
17.2	4.994 ²³⁹	86.32 ³²	9.168 ¹⁹³	68.50 ³²	44.894 ²⁰⁴	22.13 ¹⁴	53.829 ¹⁹¹	75.62 ²⁹
	223	75	181	63	188	0	179	57
27.2	4.771	85.57	8.987	67.87	44.706	22.13	53.650	75.05
Nov. 6.2	4.571 ²⁰⁰	84.39 ¹¹⁸	8.829 ¹⁵⁸	66.95 ⁹²	44.544 ¹⁶²	22.00 ¹³	53.491 ¹⁵⁹	74.17 ⁸⁸
16.1	4.402 ¹⁶⁹	82.78 ¹⁶¹	8.700 ¹²⁹	65.73 ¹²²	44.417 ¹²⁷	21.73 ²⁷	53.361 ¹³⁰	72.99 ¹¹⁸
26.1	4.271 ¹³¹	80.81 ¹⁹⁷	8.605 ⁹⁵	64.25 ¹⁴⁸	44.331 ⁸⁶	21.38 ³⁵	53.266 ⁹⁵	71.57 ¹⁴²
Dec. 6.1	4.181 ⁹⁰	78.50 ²³¹	8.551 ⁵⁴	62.51 ¹⁷⁴	44.293 ³⁸	20.96 ⁴²	53.206 ⁶⁰	69.93 ¹⁶⁴
	43	280	11	194	11	47	13	187
16.1	4.138	75.90	8.540	60.57	44.304	20.49	53.193	68.06
26.0	4.144 ⁶	73.09 ²⁸¹	8.572 ³²	58.48 ²⁰⁹	44.365 ⁶¹	20.00 ⁴⁹	53.220 ²⁷	66.04 ²⁰²
36.0	4.200 ⁵⁶	70.17 ²⁹²	8.646 ⁷⁴	56.31 ²¹⁷	44.473 ¹⁰⁸	19.52 ⁴⁸	53.289 ⁶⁹	63.94 ²¹⁰
Mean Place	3.759	58.78	7.634	45.34	42.789	30.50	52.239	52.54
Sec δ , Tan δ	1.187	+0.639	1.035	+0.267	1.155	-0.577	1.030	+0.245
$D\alpha$, $D\omega$	+0.045	-0.010	+0.054	-0.004	+0.076	+0.010	+0.055	-0.004
$D\psi\delta$, $D\omega\delta$	+0.10	-0.97	+0.10	-0.97	+0.10	-0.97	+0.11	-0.96

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Aquilæ. Mag. 3.6		α Coronæ Australis. Mag. 4.1		ι Lyrae. Mag. 5.1		π Sagittarii. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 2	° ' " - 4 59	h m 19 4	° ' " -38 1	h m 19 4	° ' " +35 58	h m 19 5	° ' " -21 8
	s	"	s	"	s	"	s	"
Jan. 1.0	8.298	48.90	12.094	27.21	31.680	52.40	9.515	43.16
11.0	8.406	49.93	12.231	26.18	31.750	49.39	9.632	43.18
21.0	8.549	50.93	12.414	25.16	31.867	46.40	9.790	43.19
30.9	8.725	51.88	12.637	24.16	32.028	43.55	9.979	43.15
Feb. 9.9	8.926	52.68	12.895	23.21	32.229	40.96	10.198	43.09
19.9	9.152	53.33	13.183	22.32	32.463	38.71	10.440	42.97
Mar. 1.9	9.397	53.77	13.494	21.46	32.728	36.91	10.705	42.76
11.8	9.659	53.99	13.826	20.69	33.016	35.61	10.987	42.47
21.8	9.932	53.95	14.172	20.00	33.324	34.86	11.280	42.09
31.8	10.213	53.66	14.528	19.38	33.641	34.69	11.583	41.61
Apr. 10.7	10.499	53.11	14.889	18.84	33.964	35.10	11.891	41.04
20.7	10.786	52.35	15.251	18.44	34.286	36.08	12.200	40.42
30.7	11.068	51.37	15.607	18.14	34.599	37.56	12.505	39.75
May 10.7	11.341	50.26	15.954	18.00	34.896	39.49	12.801	39.08
20.6	11.600	49.02	16.282	18.01	35.172	41.79	13.083	38.42
30.6	11.839	47.73	16.586	18.18	35.418	44.41	13.345	37.84
June 9.6	12.053	46.44	16.858	18.53	35.629	47.24	13.579	37.33
19.6	12.236	45.16	17.093	19.05	35.801	50.20	13.784	36.92
29.5	12.384	43.96	17.284	19.72	35.928	53.21	13.949	36.58
July 9.5	12.491	42.85	17.426	20.53	36.006	56.18	14.073	36.40
19.5	12.557	41.86	17.516	21.44	36.035	59.06	14.152	36.33
29.4	12.580	40.99	17.551	22.43	36.014	61.77	14.185	36.38
Aug. 8.4	12.560	40.29	17.531	23.46	35.943	64.24	14.170	36.53
18.4	12.497	39.74	17.458	24.50	35.826	66.42	14.113	36.75
28.4	12.398	39.34	17.338	25.47	35.667	68.29	14.013	37.03
Sept. 7.3	12.265	39.07	17.175	26.34	35.473	69.78	13.876	37.33
17.3	12.109	38.95	16.979	27.07	35.250	70.87	13.714	37.66
27.3	11.935	38.97	16.763	27.63	35.009	71.55	13.532	37.95
Oct. 7.3	11.753	39.11	16.535	27.98	34.759	71.78	13.341	38.21
17.2	11.576	39.37	16.311	28.12	34.509	71.56	13.154	38.43
27.2	11.409	39.75	16.099	28.02	34.271	70.89	12.978	38.60
Nov. 6.2	11.264	40.25	15.915	27.73	34.054	69.76	12.825	38.73
16.1	11.148	40.88	15.767	27.23	33.866	68.20	12.703	38.81
26.1	11.069	41.62	15.664	26.55	33.717	66.23	12.620	38.87
Dec. 6.1	11.026	42.46	15.610	25.74	33.612	63.90	12.578	38.92
16.1	11.028	43.39	15.611	24.83	33.552	61.25	12.581	38.95
26.0	11.073	44.40	15.667	23.85	33.542	58.38	12.632	38.99
36.0	11.157	45.45	15.775	22.85	33.580	55.36	12.725	39.04
Mean Place	9.751	56.56	14.053	33.88	33.268	42.91	11.124	50.17
Sec δ , Tan δ	1.004	-0.087	1.269	-0.782	1.236	+0.726	1.072	-0.387
$D\psi\alpha$, $D\omega\alpha$	+0.063	+0.002	+0.081	+0.014	+0.043	-0.013	+0.071	+0.007
$D\psi\delta$, $D\omega\delta$	+0.11	-0.96	+0.11	-0.96	+0.11	-0.96	+0.11	-0.96

APPARENT PLACES OF STARS, 1923.

471

FOR THE UPPER TRANSIT AT WASHINGTON, MARYLAND

Washington Mean Time.	ψ Sagittarii. Mag. 4.9		δ Draconis. Mag. 3.2		d Sagittarii. Mag. 5.0		θ Lyrae. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 10	° ' -25 23	h m 19 12	° ' +67 31	h m 19 13	° ' -19 5	h m 19 13	° ' +37 59
	s	"	s	"	s	"	s	"
Jan. 1.0	47.531	20.07	29.51	45.21	6.245	21.57	40.077	55.10
11.0	47.647 ¹¹⁶	19.82 ²⁵	29.49 ²	41.69 ³⁵²	6.353 ¹⁰⁸	21.70 ¹³	40.136 ⁵⁹	52.04 ³⁰⁶
21.0	47.802 ¹⁵⁵	19.54 ²⁸	29.58 ⁹	38.14 ³⁵⁵	6.497 ¹⁴⁴	21.80 ¹⁰	40.240 ¹⁰⁴	49.01 ³⁰³
30.9	47.992 ¹⁹⁰	19.24 ³⁰	29.77 ¹⁹	34.70 ³⁴⁴	6.677 ¹⁸⁰	21.87 ⁷	40.391 ¹⁵¹	46.10 ²⁹¹
Feb. 9.9	48.213 ²²¹	18.92 ³²	30.07 ³⁰	31.51 ³¹⁹	6.886 ²⁰⁹	21.88 ¹	40.581 ¹⁹⁰	43.41 ²⁶⁹
	247	38	38	283	233	6	231	233
19.9	48.460	18.54	30.45	28.68	7.119	21.82	40.812	41.08
Mar. 1.9	48.729 ²⁶⁹	18.14 ⁴⁰	30.91 ⁴⁶	26.33 ²³⁵	7.374 ²⁵⁵	21.65 ¹⁷	41.075 ²⁶³	39.16 ¹⁹²
11.8	49.016 ²⁸⁷	17.68 ⁴⁶	31.44 ⁵³	24.50 ¹⁸³	7.646 ²⁷²	21.37 ²⁸	41.364 ²⁸⁹	37.76 ¹⁴⁰
21.8	49.317 ³⁰¹	17.16 ⁵²	32.01 ⁵⁷	23.31 ¹¹⁹	7.931 ²⁸⁵	20.98 ³⁹	41.672 ³⁰⁸	36.92 ⁸⁴
31.8	49.626 ³⁰⁹	16.59 ⁵⁷	32.61 ⁶⁰	22.76 ⁵⁵	8.227 ²⁹⁶	20.47 ⁵¹	41.995 ³²³	36.66 ²⁶
	318	60	61	12	303	62	330	32
Apr. 10.7	49.944	15.99	33.22	22.88	8.530	19.85	42.325	36.98
20.7	50.263 ³¹⁹	15.36 ⁶³	33.82 ⁶⁰	23.64 ⁷⁶	8.836 ³⁰⁶	19.15 ⁷⁰	42.654 ³²⁹	37.89 ⁹¹
30.7	50.579 ³¹⁶	14.74 ⁶²	34.40 ⁵⁸	25.01 ¹³⁷	9.137 ³⁰¹	18.39 ⁷⁶	42.977 ³²³	39.31 ¹⁴²
May 10.7	50.888 ³⁰⁹	14.16 ⁵⁸	34.93 ⁵³	26.96 ¹⁹⁵	9.433 ²⁹⁶	17.63 ⁷⁶	43.285 ³⁰⁸	41.21 ¹⁹⁰
20.6	51.182 ²⁹⁴	13.64 ⁵²	35.41 ⁴⁸	29.37 ²⁴¹	9.715 ²⁸²	16.85 ⁷⁸	43.570 ²⁸⁵	43.51 ²³⁰
	272	43	41	281	263	73	262	260
30.6	51.454	13.21	35.82	32.18	9.978	16.12	43.832	46.11
June 9.6	51.702 ²⁴⁸	12.88 ³³	36.14 ³²	35.29 ³¹¹	10.217 ²³⁹	15.46 ⁶⁶	44.054 ²²²	48.97 ²⁸⁶
19.6	51.916 ²¹⁴	12.66 ²²	36.38 ²⁴	38.63 ³³⁴	10.425 ²⁰⁸	14.88 ⁵⁸	44.235 ¹⁸¹	51.97 ³⁰⁰
29.5	52.095 ¹⁷⁹	12.57 ⁹	36.52 ¹⁴	42.08 ³¹⁵	10.595 ¹⁷⁰	14.43 ⁴⁵	44.370 ¹³⁵	55.04 ³⁰⁷
July 9.5	52.229 ¹³⁴	12.61 ⁴	36.56 ⁴	45.57 ³¹⁹	10.725 ¹³⁰	14.10 ³³	44.456 ⁸⁶	58.11 ³⁰⁷
	88	18	6	314	85	20	35	298
19.5	52.317 ³⁹	12.79 ²⁸	36.50 ¹⁵	49.01 ³³⁰	10.810 ⁴⁰	13.90 ⁸	44.491 ¹⁶	61.09 ²⁸¹
29.4	52.356 ⁹	13.07 ³⁶	36.35 ²⁵	52.31 ³⁰⁶	10.850 ⁷	13.82 ³	44.475 ⁶⁵	63.90 ²⁵⁹
Aug. 8.4	52.347 ⁵⁶	13.43 ⁴⁴	36.10 ³⁴	55.37 ²⁸⁰	10.843 ⁵²	13.85 ¹³	44.410 ¹¹⁵	66.49 ²³⁰
18.4	52.291 ⁹⁸	13.87 ⁴⁷	35.76 ⁴¹	58.17 ²⁴⁵	10.791 ⁹²	13.98 ²⁰	44.295 ¹⁵⁸	68.79 ²⁰¹
28.4	52.193 ¹³⁶	14.34 ⁴⁷	35.35 ⁴⁸	60.62 ²⁰⁷	10.699 ¹²⁹	14.18 ²⁶	44.137 ¹⁹⁶	70.80 ¹⁶³
Sept. 7.3	52.057 ¹⁶⁵	14.81 ⁴⁵	34.87 ⁵⁴	62.69 ¹⁶¹	10.570 ¹⁵⁸	14.44 ²⁸	43.941 ²²⁵	72.43 ¹²⁰
17.3	51.892 ¹⁸⁶	15.26 ³⁹	34.33 ⁵⁷	64.30 ¹¹¹	10.412 ¹⁷⁷	14.72 ²⁹	43.716 ²¹⁵	73.63 ⁸¹
27.3	51.706 ¹⁹⁶	15.65 ³³	33.76 ⁶⁰	65.41 ⁶²	10.235 ¹⁸⁷	15.01 ²⁸	43.471 ²⁵⁷	74.44 ³⁵
Oct. 7.3	51.510 ¹⁹⁴	15.98 ²⁴	33.16 ⁶¹	66.03 ⁸	10.048 ¹⁸⁵	15.29 ²⁵	43.214 ²⁵⁹	74.79 ¹⁰
17.2	51.316 ¹⁸²	16.22 ¹⁴	32.55 ⁵⁹	66.11 ⁴⁸	9.863 ¹⁷⁶	15.54 ²²	42.955 ²⁴⁷	74.69 ⁶⁰
27.2	51.134 ¹⁶⁰	16.36 ⁴	31.96 ⁵⁷	65.63 ¹⁰⁴	9.687 ¹⁵⁵	15.76 ²⁰	42.708 ²²⁹	74.09 ¹⁰⁶
Nov. 6.2	50.974 ¹²⁹	16.40 ⁴	31.39 ⁵²	64.59 ¹⁵⁶	9.532 ¹²⁴	15.96 ¹⁷	42.479 ¹⁹⁹	73.03 ¹⁴⁸
16.1	50.845 ⁹¹	16.36 ¹¹	30.87 ⁴⁵	63.03 ²⁰⁹	9.408 ⁸⁷	16.13 ¹⁶	42.280 ¹⁶⁶	71.55 ¹⁹⁴
26.1	50.754 ⁴⁷	16.25 ¹⁶	30.42 ³⁸	60.94 ²⁵⁵	9.321 ⁴⁸	16.29 ¹⁵	42.114 ¹¹⁹	69.61 ²³³
Dec. 6.1	50.707 ³	16.09 ²⁰	30.04 ²⁹	58.39 ²⁹⁶	9.273 ³	16.44 ¹⁵	41.995 ⁷⁴	67.28 ²⁶⁰
16.1	50.704 ⁴⁶	15.89 ²³	29.75 ²⁰	55.43 ³²⁵	9.270 ⁴¹	16.59 ¹⁵	41.921 ²⁶	64.68 ²⁸⁸
26.0	50.750 ⁹¹	15.66 ²³	29.55 ⁸	52.18 ³⁴⁹	9.311 ⁸⁴	16.74 ¹⁶	41.895 ²⁷	61.80 ³⁰⁵
36.0	50.841	15.43	29.47	48.69	9.395	16.90	41.922	58.75
Mean Place	49.207	26.68	32.541	33.81	7.822	28.33	41.673	45.18
Sec δ , Tan δ	1.107	-0.475	2.616	+2.418	1.058	-0.346	1.269	+0.781
$D\psi\alpha$, $D\omega\alpha$	+0.073	+0.010	0.000	-0.050	+0.070	+0.007	+0.041	-0.016
$D\psi\delta$, $D\omega\delta$	+0.12	-0.95	+0.12	-0.95	+0.12	-0.95	+0.13	-0.95

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ω Aquilæ. Mag. 5.1		κ Cygni. Mag. 4.0		τ Draconis. Mag. 4.6		δ Aquilæ. Mag. 3.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 14 s	° ' +11 27 "	h m 19 15 s	° ' +53 13 "	h m 19 16 s	° ' +73 12 "	h m 19 21 s	° ' + 2 57 "
Jan. 1.0	10.732	28.09	17.460	43.91	58.80	58.70	35.566	44.28
11.0	10.815	26.16	17.487	40.50	58.72	55.22	35.649	42.84
21.0	10.935	24.26	17.581	37.09	58.79	51.68	35.770	41.43
30.9	11.089	22.46	17.739	33.79	58.99	48.24	35.920	40.10
Feb. 9.9	11.272	20.84	17.956	30.74	59.34	45.01	36.103	38.92
19.9	11.483	19.47	18.227	28.05	59.81	42.13	36.306	37.95
Mar. 1.9	11.716	18.41	18.544	25.81	60.39	39.71	36.536	37.23
11.8	11.968	17.71	18.900	24.12	61.05	37.85	36.785	36.80
21.8	12.233	17.41	19.285	23.04	61.78	36.52	37.046	36.70
31.8	12.510	17.50	19.688	22.59	62.56	35.85	37.322	36.94
Apr. 10.8	12.794	18.02	20.100	22.79	63.34	35.90	37.603	37.49
20.7	13.080	18.89	20.510	23.62	64.12	36.55	37.889	38.36
30.7	13.362	20.12	20.907	25.03	64.86	37.82	38.172	39.48
May 10.7	13.635	21.65	21.284	26.98	65.55	39.65	38.450	40.83
20.6	13.895	23.40	21.627	29.39	66.16	41.98	38.715	42.35
30.6	14.134	25.34	21.930	32.18	66.68	44.71	38.962	44.00
June 9.6	14.348	27.38	22.184	35.25	67.08	47.78	39.183	45.71
19.6	14.531	29.48	22.383	38.54	67.37	51.07	39.379	47.42
29.5	14.679	31.55	22.521	41.91	67.54	54.49	39.536	49.14
July 9.5	14.785	33.58	22.595	45.30	67.57	57.97	39.657	50.73
19.5	14.850	35.48	22.604	48.63	67.47	61.41	39.735	52.23
29.5	14.872	37.24	22.547	51.82	67.25	64.71	39.771	53.56
Aug. 8.4	14.850	38.79	22.427	54.76	66.90	67.83	39.761	54.74
18.4	14.786	40.15	22.247	57.44	66.44	70.69	39.709	55.71
28.4	14.684	41.24	22.013	59.76	65.88	73.22	39.623	56.50
Sept. 7.3	14.548	42.11	21.732	61.71	65.22	75.37	39.500	57.06
17.3	14.387	42.69	21.415	63.21	64.50	77.05	39.351	57.43
27.3	14.208	43.02	21.070	64.23	63.73	78.29	39.181	57.62
Oct. 7.3	14.019	43.06	20.711	64.76	62.92	79.04	39.001	57.60
17.2	13.831	42.84	20.348	64.78	62.10	79.23	38.820	57.36
27.2	13.652	42.33	19.996	64.26	61.29	78.85	38.650	56.93
Nov. 6.2	13.492	41.54	19.664	63.21	60.51	77.94	38.498	56.29
16.2	13.360	40.50	19.366	61.64	59.79	76.50	38.371	55.48
26.1	13.258	39.20	19.111	59.58	59.14	74.49	38.274	54.49
Dec. 6.1	13.197	37.71	18.908	57.09	58.59	72.03	38.214	53.34
16.1	13.173	36.00	18.763	54.21	58.15	69.17	38.195	52.09
26.0	13.192	34.16	18.682	51.05	57.84	65.97	38.216	50.69
36.0	13.251	32.22	18.668	47.67	57.67	62.55	38.276	49.24
Mean Place	12.131	19.77	19.456	33.02	62.706	46.72	36.968	36.56
Sec δ , Tan δ	1.020	+0.203	1.670	+1.338	3.463	+3.315	1.001	+0.052
$D\psi\alpha$, $D\omega\alpha$	+0.056	-0.004	+0.028	-0.029	-0.022	-0.073	+0.060	-0.001
$D\psi\delta$, $D\omega\delta$	+0.13	-0.95	+0.13	-0.95	+0.13	-0.94	+0.14	-0.94

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Cygni. Mag. 3.2		ι Cygni. Mag. 3.9		μ Aquilæ. Mag. 4.6		h Sagittarii. Mag. 4.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 27 s	° ' " +27 47 "	h m 19 27 s	° ' " +51 33 "	h m 19 30 s	° ' " + 7 12 "	h m 19 31 s	° ' " -25 3 "
Jan. 1.0	35.503	58.80	44.048	66.04	18.323	60.31	59.703	11.99
11.0	35.560	56.15	44.061	62.70	18.393	58.66	59.795	11.68
21.0	35.654	53.50	44.136	59.33	18.501	57.02	59.928	11.35
31.0	35.790	50.96	44.271	56.05	18.642	55.46	60.096	10.97
Feb. 9.9	35.963	48.63	44.467	52.99	18.814	54.08	60.295	10.56
19.9	36.165	46.58	44.715	50.26	19.012	52.91	60.523	10.07
Mar. 1.9	36.400	44.88	45.010	47.96	19.233	52.01	60.775	9.54
11.8	36.658	43.68	45.343	46.18	19.475	51.45	61.048	8.94
21.8	36.936	42.96	45.708	45.01	19.733	51.23	61.339	8.27
31.8	37.229	42.76	46.092	44.45	20.006	51.37	61.642	7.54
Apr. 10.8	37.530	43.07	46.490	44.53	20.288	51.89	61.955	6.78
20.7	37.835	43.89	46.890	45.24	20.572	52.74	62.275	5.99
30.7	38.137	45.19	47.281	46.54	20.857	53.91	62.594	5.20
May 10.7	38.430	46.92	47.656	48.37	21.137	55.34	62.910	4.46
20.7	38.707	49.00	48.001	50.69	21.405	56.98	63.212	3.77
30.6	38.966	51.38	48.311	53.40	21.655	58.77	63.499	3.18
June 9.6	39.190	53.94	48.576	56.41	21.882	60.66	63.762	2.71
19.6	39.381	56.66	48.788	59.63	22.082	62.60	63.993	2.37
29.5	39.536	59.42	48.945	62.98	22.245	64.51	64.189	2.18
July 9.5	39.644	62.17	49.039	66.37	22.371	66.36	64.343	2.11
19.5	39.709	64.84	49.071	69.70	22.454	68.09	64.452	2.22
29.5	39.724	67.35	49.039	72.92	22.494	69.67	64.512	2.46
Aug. 8.4	39.693	69.69	48.943	75.93	22.490	71.08	64.524	2.81
18.4	39.620	71.76	48.791	78.68	22.443	72.27	64.488	3.25
28.4	39.501	73.54	48.582	81.10	22.359	73.25	64.407	3.75
Sept. 7.4	39.346	74.98	48.323	83.15	22.237	74.01	64.286	4.28
17.3	39.161	76.11	48.034	84.77	22.090	74.52	64.134	4.80
27.3	38.957	76.85	47.713	85.92	21.921	74.81	63.957	5.29
Oct. 7.3	38.743	77.21	47.374	86.60	21.741	74.85	63.766	5.72
17.2	38.524	77.14	47.030	86.77	21.559	74.65	63.574	6.08
27.2	38.310	76.67	46.692	86.41	21.385	74.23	63.388	6.32
Nov. 6.2	38.115	75.82	46.370	85.52	21.225	73.56	63.221	6.46
16.2	37.945	74.55	46.080	84.10	21.090	72.69	63.082	6.52
26.1	37.806	72.93	45.828	82.20	20.986	71.58	62.977	6.48
Dec. 6.1	37.703	70.98	45.624	79.83	20.918	70.29	62.912	6.37
16.1	37.642	68.73	45.475	77.09	20.886	68.83	62.891	6.20
26.1	37.626	66.24	45.385	74.02	20.894	67.25	62.915	6.00
36.0	37.652	63.61	45.357	70.75	20.944	65.60	62.982	5.74
Mean Place	36.940	49.15	45.915	54.59	19.700	52.34	61.374	17.44
Sec δ , Tan δ	1.130	+0.527	1.609	+1.260	1.008	+0.127	1.104	-0.467
$D\psi\alpha$, $D\omega\alpha$	+0.048	-0.013	+0.030	-0.031	+0.058	-0.003	+0.073	+0.012
$D\psi\delta$, $D\omega\delta$	+0.15	-0.93	+0.15	-0.93	+0.15	-0.92	+0.16	-0.92

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Aquilæ. Mag. 5.0		θ Cygni. Mag. 4.6		ϵ Sagittarii. Mag. 5.4		β Sagittæ. Mag. 4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 32	° ' — 7 11	h m 19 34	° ' +50 2	h m 19 36	° ' —16 27	h m 19 37	° ' +17 17
	s "	"	s "	"	s "	"	s "	"
Jan. 1.0	43.567	52.10	20.832	43.29	17.261	69.74	34.045	56.96
11.0	43.646 ⁷⁹	52.90 ⁸⁰	20.839 ⁷	40.03 ³²⁶	17.343 ⁸²	69.97 ²³	34.101 ⁵⁶	54.81 ²¹⁵
21.0	43.762 ¹¹⁶	53.69 ⁷⁹	20.907 ⁶⁸	36.70 ³³³	17.462 ¹¹⁹	70.17 ²⁰	34.195 ⁹⁴	52.66 ²¹⁵
31.0	43.909 ¹⁴⁷	54.41 ⁷²	21.032 ¹²⁵	33.45 ³²⁵	17.616 ¹⁵⁴	70.30 ¹³	34.321 ¹²⁶	50.60 ²⁰⁶
Feb. 9.9	44.087 ¹⁷⁸	54.99 ⁵⁸	21.214 ¹⁸²	30.41 ³⁰⁴	17.799 ¹⁸³	70.35 ⁵	34.484 ¹⁶³	48.73 ¹⁸⁷
	204	45	235	273	210	4	188	165
19.9	44.291	55.44	21.449	27.68	18.009	70.31	34.672	47.08
Mar. 1.9	44.516 ²²⁵	55.70 ²⁶	21.729 ²⁸⁰	25.38 ²³⁰	18.244 ²³⁵	70.12 ¹⁹	34.891 ²¹⁹	45.78 ¹³⁰
11.8	44.761 ²⁴⁵	55.75 ⁵	22.047 ³¹⁸	23.58 ¹⁸⁰	18.497 ²⁵³	69.82 ³⁰	35.132 ²⁴¹	44.86 ⁹²
21.8	45.024 ²⁶³	55.56 ¹⁹	22.397 ³⁵⁰	22.37 ¹²¹	18.769 ²⁷²	69.36 ⁴⁶	35.392 ²⁶⁰	44.36 ⁵⁰
31.8	45.298 ²⁷⁴	55.14 ⁴²	22.770 ³⁷³	21.77 ⁶⁰	19.054 ²⁸⁵	68.75 ⁶¹	35.665 ²⁷³	44.30 ⁶
	285	65	386	3	296	74	287	40
Apr. 10.8	45.583	54.49	23.156	21.80	19.350	68.01	35.952	44.70
20.7	45.873 ²⁹⁰	53.64 ⁸⁵	23.546 ³⁹⁰	22.46 ⁶⁶	19.651 ³⁰¹	67.18 ⁸³	36.243 ²⁹¹	45.52 ⁸²
30.7	46.163 ²⁹⁰	52.62 ¹⁰²	23.930 ³⁸⁴	23.70 ¹²⁴	19.954 ³⁰³	66.25 ⁹³	36.534 ²⁹¹	46.75 ¹²³
May 10.7	46.450 ²⁸⁷	51.45 ¹¹⁷	24.299 ³⁶⁹	25.49 ¹⁷⁹	20.254 ³⁰⁰	65.27 ⁹⁸	36.821 ²⁸⁷	48.29 ¹⁵⁴
20.7	46.726 ²⁷⁶	50.20 ¹²⁵	24.643 ³⁴⁴	27.75 ²²⁶	20.542 ²⁸⁸	64.27 ¹⁰⁰	37.092 ²⁷¹	50.19 ¹⁹⁰
	260	131	310	266	273	95	254	209
30.6	46.986	48.89	24.953	30.41	20.815	63.32	37.346	52.28
June 9.6	47.224 ²³⁸	47.59 ¹³⁰	25.221 ²⁶⁸	33.38 ²⁹⁷	21.066 ²⁵¹	62.41 ⁹¹	37.580 ²³⁴	54.53 ²²⁵
19.6	47.433 ²⁰⁹	46.32 ¹²⁷	25.440 ²¹⁹	36.57 ³¹⁹	21.289 ²²³	61.59 ⁸²	37.780 ²⁰⁰	56.88 ²³⁵
29.5	47.609 ¹⁷⁶	45.14 ¹¹⁸	25.604 ¹⁶⁴	39.89 ³³²	21.478 ¹⁸⁹	60.91 ⁶⁸	37.943 ¹⁶³	59.25 ²³⁷
July 9.5	47.747 ¹³⁸	44.06 ¹⁰⁸	25.710 ¹⁰⁶	43.27 ³³⁸	21.628 ¹⁵⁰	60.34 ⁵⁷	38.070 ¹²⁷	61.61 ²³⁶
	96	95	43	333	106	41	82	224
19.5	47.843	43.11	25.753	46.60	21.734	59.93	38.152	63.85
29.5	47.894 ⁵¹	42.31 ⁸⁰	25.735 ¹⁸	49.82 ³²²	21.793 ⁵⁹	59.65 ²⁸	38.190 ³⁸	65.95 ²¹⁰
Aug. 8.4	47.901 ⁷	41.67 ⁶⁴	25.657 ⁷⁸	52.84 ³⁰²	21.808 ¹⁵	59.53 ¹²	38.181 ⁹	67.87 ¹⁹²
18.4	47.864 ³⁷	41.18 ⁴⁹	25.519 ¹³⁸	55.62 ²⁷⁸	21.775 ³³	59.52 ¹	38.129 ⁵²	69.58 ¹⁷¹
28.4	47.787 ⁷⁷	40.84 ³⁴	25.328 ¹⁹¹	58.07 ²⁴⁵	21.702 ⁷³	59.62 ¹⁰	38.041 ⁸⁸	71.01 ¹⁴³
	113	18	238	209	112	20	128	116
Sept. 7.4	47.674	40.66	25.090	60.16	21.590	59.82	37.913	72.17
17.3	47.532 ¹⁴²	40.60 ⁶	24.814 ²⁷⁶	61.83 ¹⁶⁷	21.447 ¹⁴³	60.08 ²⁶	37.756 ¹⁵⁷	73.06 ⁸⁹
27.3	47.368 ¹⁶⁴	40.66 ⁶	24.509 ³⁰⁵	63.06 ¹²³	21.282 ¹⁶⁵	60.38 ³⁰	37.578 ¹⁷⁸	73.61 ⁵⁵
Oct. 7.3	47.193 ¹⁷⁵	40.83 ¹⁷	24.185 ³²⁴	63.81 ⁷⁵	21.104 ¹⁷⁸	60.70 ³²	37.388 ¹⁹⁰	73.85 ²⁴
17.2	47.015 ¹⁷⁸	41.11 ²⁸	23.856 ³²⁹	64.04 ²³	20.922 ¹⁸²	61.03 ³³	37.195 ¹⁹³	73.79 ⁶
	169	37	325	27	175	32	187	41
27.2	46.846	41.48	23.531	63.77	20.747	61.35	37.008	73.38
Nov. 6.2	46.692 ¹⁵⁴	41.93 ⁴⁵	23.223 ³⁰⁸	62.95 ⁸²	20.588 ¹⁵⁹	61.66 ³¹	36.831 ¹⁷⁷	72.65 ⁷³
16.2	46.563 ¹²⁹	42.47 ⁵⁴	22.941 ²⁸²	61.63 ¹³²	20.455 ¹³³	61.97 ³¹	36.679 ¹⁵²	71.61 ¹⁰⁴
26.1	46.464 ⁹⁹	43.09 ⁶²	22.696 ²⁴⁵	59.80 ¹⁸³	20.353 ¹⁰²	62.28 ³¹	36.559 ¹²⁰	70.30 ¹³¹
Dec. 6.1	46.403 ⁶¹	43.80 ⁷¹	22.496 ²⁰⁰	57.54 ²²⁶	20.291 ⁶²	62.56 ²⁸	36.472 ⁸⁷	68.70 ¹⁶⁰
	22	76	146	287	25	29	51	185
16.1	46.381	44.56	22.350	54.87	20.266	62.85	36.421	66.85
26.1	46.398 ¹⁷	45.37 ⁸¹	22.258 ⁹²	51.87 ³⁰⁰	20.283 ¹⁷	63.13 ²⁸	36.412 ⁹	64.83 ²⁰²
36.0	46.455 ⁵⁷	46.21 ⁸⁴	22.227 ³¹	48.66 ³²¹	20.343 ⁶⁰	63.40 ²⁷	36.442 ³⁰	62.70 ²¹³
Mean Place	45.009	58.85	22.616	31.66	18.797	75.61	35.407	48.10
Sec δ , Tan δ	1.008	−0.126	1.557	+1.194	1.043	−0.296	1.047	+0.311
$D\psi\alpha$, $D\omega\alpha$	+0.064	+0.003	+0.032	−0.032	+0.068	+0.008	+0.054	−0.009
$D\psi\delta$, $D\omega\delta$	+0.16	−0.92	+0.16	−0.92	+0.16	−0.91	+0.16	−0.91

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	15 Cygni. Mag. 5.0		<i>f</i> Sagittarii. Mag. 5.1		δ Cygni. Mag. 3.0		γ Aquilæ. Mag. 2.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 41 s	° ' " +37 9 "	h m 19 41 s	° ' " -19 56 "	h m 19 42 s	° ' " +44 56 "	h m 19 42 s	° ' " +10 25 "
Jan. 1.0	28.537	74.59	50.721	45.11	32.540	43.08	34.581	36.65
11.0	28.562	71.66	50.799	45.11	32.550	39.94	34.638	34.86
21.0	28.635	68.70	50.916	45.07	32.610	36.74	34.730	33.08
31.0	28.753	65.81	51.067	44.98	32.726	33.62	34.855	31.39
Feb. 9.9	28.913	63.12	51.248	44.81	32.890	30.69	35.015	29.85
19.9	29.113	60.70	51.458	44.56	33.103	28.05	35.199	28.55
Mar. 1.9	29.348	58.68	51.692	44.20	33.357	25.82	35.413	27.52
11.9	29.614	57.13	51.947	43.73	33.644	24.03	35.648	26.84
21.8	29.904	56.10	52.221	43.14	33.963	22.83	35.901	26.49
31.8	30.215	55.65	52.510	42.44	34.303	22.24	36.169	26.56
Apr. 10.8	30.538	55.77	52.811	41.64	34.659	22.24	36.449	27.04
20.7	30.867	56.45	53.118	40.77	35.021	22.86	36.735	27.89
30.7	31.197	57.67	53.427	39.85	35.381	24.04	37.023	29.06
May 10.7	31.518	59.38	53.733	38.93	35.728	25.77	37.309	30.54
20.7	31.819	61.52	54.030	38.00	36.055	27.93	37.581	32.26
30.6	32.099	64.01	54.310	37.14	36.357	30.50	37.838	34.17
June 9.6	32.346	66.76	54.571	36.36	36.620	33.37	38.072	36.17
19.6	32.558	69.70	54.801	35.70	36.841	36.47	38.280	38.28
29.6	32.726	72.76	54.999	35.18	37.012	39.68	38.450	40.36
July 9.5	32.846	75.84	55.157	34.81	37.129	42.96	38.585	42.41
19.5	32.916	78.85	55.270	34.58	37.193	46.20	38.676	44.33
29.5	32.935	81.76	55.337	34.50	37.197	49.36	38.723	46.14
Aug. 8.4	32.901	84.47	55.358	34.56	37.149	52.30	38.729	47.73
18.4	32.818	86.94	55.330	34.75	37.042	55.01	38.690	49.13
28.4	32.689	89.11	55.259	35.02	36.887	57.40	38.613	50.30
Sept. 7.4	32.519	90.96	55.150	35.36	36.686	59.47	38.496	51.22
17.3	32.316	92.42	55.007	35.75	36.447	61.11	38.352	51.91
27.3	32.088	93.47	54.842	36.15	36.184	62.32	38.183	52.29
Oct. 7.3	31.845	94.10	54.661	36.56	35.900	63.10	38.004	52.45
17.3	31.595	94.27	54.476	36.94	35.610	63.37	37.820	52.33
27.2	31.349	93.98	54.297	37.27	35.323	63.15	37.641	51.95
Nov. 6.2	31.117	93.23	54.134	37.54	35.050	62.42	37.475	51.30
16.2	30.909	92.02	53.995	37.78	34.802	61.19	37.333	50.40
26.1	30.732	90.37	53.888	37.95	34.585	59.48	37.219	49.25
Dec. 6.1	30.592	88.32	53.820	38.10	34.408	57.34	37.140	47.89
16.1	30.494	85.93	53.789	38.21	34.280	54.80	37.092	46.38
26.1	30.442	83.25	53.802	38.29	34.200	51.95	37.088	44.69
36.0	30.438	80.37	53.858	38.34	34.175	48.87	37.120	42.90
Mean Place	30.018	63.74	52.301	50.45	34.153	31.50	35.929	28.46
Sec δ , Tan δ	1.255	+0.758	1.064	-0.363	1.413	+0.998	1.017	+0.184
$D\psi\alpha$, $D\omega\alpha$	+0.043	-0.022	+0.070	+0.010	+0.037	-0.029	+0.057	-0.005
$D\psi\delta$, $D\omega\delta$	+0.17	-0.90	+0.17	-0.90	+0.17	-0.90	+0.17	-0.90

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	δ Sagittæ. Mag. 3.8		α Aquilæ. (Altair.) Mag. 0.9		ϵ Draconis. Mag. 4.0		η Aquilæ. Var. 3.7-4.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 43 s	° ' " +18 20 "	h m 19 47 s	° ' " + 8 39 "	h m 19 48 s	° ' " +70 4 "	h m 19 48 s	° ' " + 0 48 "
Jan. 1.0	55.918	45.39	0.241	57.80	23.63	32.18	31.694	32.20
11.0	55.965	43.21	0.298	56.13	23.50	28.80	31.752	30.94
21.0	56.050	41.03	0.391	54.48	23.48	25.30	31.845	29.73
31.0	56.173	38.92	0.518	52.90	23.59	21.83	31.973	28.61
Feb. 9.9	56.328	36.99	0.676	51.49	23.81	18.48	32.130	27.60
19.9	56.512	35.30	0.861	50.31	24.15	15.41	32.314	26.77
Mar. 1.9	56.725	33.94	1.074	49.39	24.58	12.73	32.524	26.18
11.9	56.962	32.96	1.310	48.80	25.10	10.52	32.754	25.87
21.8	57.219	32.41	1.562	48.56	25.68	8.89	33.004	25.84
31.8	57.493	32.32	1.830	48.68	26.32	7.87	33.269	26.13
Apr. 10.8	57.778	32.68	2.109	49.20	26.99	7.51	33.546	26.73
20.7	58.069	33.48	2.396	50.08	27.67	7.80	33.831	27.60
30.7	58.363	34.69	2.685	51.26	28.33	8.72	34.119	28.73
May 10.7	58.650	36.26	2.969	52.74	28.96	10.24	34.404	30.07
20.7	58.928	38.12	3.244	54.45	29.55	12.27	34.682	31.58
30.6	59.188	40.25	3.503	56.33	30.06	14.78	34.944	33.21
June 9.6	59.424	42.54	3.739	58.32	30.50	17.67	35.187	34.88
19.6	59.631	44.94	3.951	60.36	30.84	20.85	35.402	36.57
29.6	59.800	47.36	4.125	62.39	31.08	24.25	35.586	38.21
July 9.5	59.932	49.77	4.263	64.35	31.21	27.75	35.731	39.77
19.5	60.019	52.08	4.358	66.24	31.23	31.28	35.836	41.21
29.5	60.063	54.25	4.408	67.94	31.14	34.76	35.896	42.50
Aug. 8.4	60.059	56.24	4.416	69.47	30.95	38.09	35.912	43.61
18.4	60.013	58.01	4.381	70.77	30.64	41.21	35.885	44.54
28.4	59.927	59.53	4.307	71.88	30.25	44.04	35.817	45.27
Sept. 7.4	59.802	60.76	4.196	72.74	29.77	46.56	35.713	45.82
17.3	59.648	61.70	4.054	73.35	29.22	48.66	35.578	46.17
27.3	59.472	62.32	3.892	73.70	28.61	50.33	35.421	46.32
Oct. 7.3	59.282	62.63	3.718	73.85	27.96	51.48	35.250	46.30
17.3	59.086	62.59	3.537	73.70	27.29	52.14	35.074	46.09
27.2	58.896	62.24	3.361	73.32	26.62	52.24	34.902	45.72
Nov. 6.2	58.719	61.54	3.198	72.68	25.96	51.77	34.744	45.18
16.2	58.563	60.52	3.056	71.84	25.34	50.73	34.607	44.47
26.1	58.437	59.21	2.944	70.76	24.77	49.16	34.498	43.62
Dec. 6.1	58.344	57.61	2.866	69.47	24.26	47.07	34.423	42.63
16.1	58.286	55.77	2.822	68.03	23.85	44.50	34.384	41.52
26.1	58.271	53.74	2.819	66.46	23.53	41.52	34.382	40.31
36.0	58.294	51.59	2.853	64.79	23.32	38.28	34.417	39.07
Mean Place	57.264	36.36	1.586	49.94	26.611	18.38	33.059	25.08
Sec δ , Tan δ	1.054	+0.332	1.012	+0.152	2.935	+2.759	1.000	+0.014
$D\psi\alpha$, $D\omega\alpha$	+0.053	-0.010	+0.058	-0.005	-0.004	-0.084	+0.061	0.000
$D\psi\delta$, $D\omega\delta$	+0.17	-0.90	+0.18	-0.89	+0.18	-0.89	+0.18	-0.89

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Sagittarii. Mag. 4.2		β Aquilæ. Mag. 3.9		ϵ Pavonis. Mag. 4.1		γ Sagittæ. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 49	° ' —42 3	h m 19 51	° ' + 6 12	h m 19 51	° ' —73 6	h m 19 55	° ' +19 16
	s	"	s	"	s	"	s	"
Jan. 1.1	54.947	75.86	30.514	56.04	36.96	54.41	18.619	64.73
11.0	55.027 80	74.49 137	30.566 52	54.50 154	37.05 9	51.46 295	18.652 33	62.54 219
21.0	55.157 130	73.07 142	30.653 87	52.95 155	37.27 22	48.47 299	18.726 74	60.35 219
31.0	55.332 175	71.60 147	30.774 121	51.51 144	37.62 35	45.52 295	18.836 110	58.22 213
Feb. 9.9	55.549 217	70.13 147	30.925 151	50.19 132	38.08 46	42.65 287	18.979 143	56.23 199
	253	145	183	110	58	269	178	172
19.9	55.802	68.68	31.108	49.09	38.66	39.96	19.157	54.51
Mar. 1.9	56.088 286	67.27 141	31.311 203	48.23 86	39.32 66	37.50 246	19.358 201	53.10 141
11.9	56.401 313	65.93 134	31.540 229	47.67 56	40.06 74	35.32 218	19.588 230	52.07 103
21.8	56.738 337	64.67 126	31.789 249	47.47 20	40.87 81	33.48 184	19.840 252	51.48 59
31.8	57.095 357	63.51 116	32.051 262	47.61 14	41.72 85	31.98 150	20.112 272	51.31 17
	370	103	278	51	88	110	281	29
Apr. 10.8	57.465	62.48	32.329	48.12	42.60	30.88	20.393	51.60
20.7	57.846 381	61.59 89	32.615 286	48.95 83	43.50 90	30.17 71	20.686 293	52.35 75
30.7	58.230 384	60.88 71	32.902 287	50.10 115	44.41 91	29.87 30	20.984 298	53.54 119
May 10.7	58.611 381	60.36 52	33.187 285	51.50 140	45.29 88	30.04 17	21.275 291	55.08 154
20.7	58.983 372	60.05 31	33.465 278	53.12 162	46.14 85	30.61 57	21.558 283	56.95 187
	352	6	263	180	80	97	265	212
30.6	59.335	59.99	33.728	54.92	46.94	31.58	21.823	59.07
June 9.6	59.661 326	60.14 15	33.968 240	56.78 186	47.66 72	32.96 138	22.071 248	61.37 230
19.6	59.952 291	60.54 40	34.185 217	58.69 191	48.29 63	34.68 172	22.284 213	63.79 242
29.6	60.202 250	61.18 64	34.366 181	60.59 190	48.82 53	36.72 204	22.465 181	66.26 247
July 9.5	60.404 202	62.02 84	34.509 143	62.42 183	49.23 41	39.05 233	22.607 142	68.72 246
	147	104	104	175	28	249	97	237
19.5	60.551 89	63.06 118	34.613 50	64.17 156	49.51 14	41.54 263	22.704 52	71.09 227
29.5	60.640 31	64.24 128	34.672 17	65.73 140	49.65 0	44.17 264	22.756 9	73.36 208
Aug. 8.4	60.671 28	65.52 134	34.689 30	67.13 119	49.65 14	46.81 259	22.765 37	75.44 184
18.4	60.643 84	66.86 132	34.659 67	68.32 101	49.51 27	49.40 245	22.728 76	77.28 162
28.4	60.559 136	68.18 127	34.592 105	69.33 78	49.24 40	51.85 221	22.652 120	78.90 133
Sept. 7.4	60.423	69.45	34.487	70.11	48.84	54.06	22.532	80.23
17.3	60.247 176	70.59 114	34.350 137	70.63 52	48.34 50	55.93 187	22.385 147	81.24 101
27.3	60.039 208	71.58 99	34.192 158	70.94 31	47.75 59	57.42 149	22.213 172	81.98 74
Oct. 7.3	59.808 231	72.33 75	34.020 172	71.01 7	47.10 65	58.44 102	22.025 188	82.37 39
17.3	59.568 240	72.85 52	33.842 178	70.87 14	46.43 67	58.97 53	22.025 195	82.41 4
	234	25	174	38	68	3	191	27
27.2	59.334	73.10	33.668	70.49	45.75	58.94	21.639	82.14
Nov. 6.2	59.116 218	73.07 3	33.503 165	69.89 60	45.11 64	58.39 55	21.460 179	81.50 64
16.2	58.928 188	72.76 31	33.362 141	69.07 82	44.53 58	57.30 109	21.299 161	80.54 96
26.1	58.777 151	72.17 59	33.249 113	68.07 100	44.03 50	55.74 156	21.166 133	79.28 126
Dec. 6.1	58.672 105	71.37 80	33.168 81	66.87 120	43.64 39	53.74 200	21.065 101	77.74 154
	56	101	49	135	27	237	68	182
16.1	58.616	70.36	33.119	65.52	43.37	51.37	20.997	75.92
26.1	58.614 2	69.18 118	33.111 8	64.07 145	43.24 13	48.71 266	20.970 27	73.90 202
36.0	58.665 51	67.88 130	33.141 30	62.54 153	43.25 1	45.86 285	20.982 12	71.76 214
Mean Place	57.063	79.01	31.855	48.38	42.581	56.22	19.935	55.54
Sec δ , Tan δ	1.347	—0.903	1.006	+0.109	3.443	—3.294	1.060	+0.350
$D\psi\alpha$, $D\omega\alpha$	+0.082	+0.028	+0.059	—0.003	+0.138	+0.103	+0.053	—0.011
$D\psi\delta$, $D\omega\delta$	+0.18	—0.89	+0.19	—0.88	+0.19	—0.88	+0.19	—0.88

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	<i>c</i> Sagittarii. Mag. 4.6		<i>τ</i> Aquilæ. Mag. 5.6		<i>θ</i> Aquilæ. Mag. 3.4		<i>o</i> Cygni <i>seq.</i> Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 19 57 s	° ' " -27 55 "	h m 20 0 s	° ' " + 7 3 "	h m 20 7 s	° ' " - 1 2 "	h m 20 11 s	° ' " +46 30 "
Jan. 1.1	53.854	26.73	21.403	43.42	18.602	56.64	10.982	38.66
11.0	53.920 ⁶⁶	26.21 ⁵²	21.444 ⁴¹	41.88 ¹⁵⁴	18.645 ⁴³	57.71 ¹⁰⁷	10.950 ³²	35.62 ³⁰⁴
21.0	54.025 ¹⁰⁵	25.62 ⁵⁹	21.522 ⁷⁸	40.32 ¹⁵⁶	18.721 ⁷⁶	58.76 ¹⁰⁵	10.970 ²⁰	32.48 ³¹⁴
31.0	54.168 ¹⁴³	24.97 ⁶⁵	21.632 ¹¹⁰	38.86 ¹⁴⁶	18.832 ¹¹¹	59.77 ¹⁰¹	11.045 ⁷⁵	29.32 ³¹⁶
Feb. 10.0	54.345 ¹⁷⁷	24.25 ⁷²	21.776 ¹⁴⁴	37.54 ¹³²	18.972 ¹⁴⁰	60.62 ⁸⁵	11.171 ¹²⁶	26.31 ³⁰¹
	208 ⁷⁶		173 ¹⁷³	113 ¹¹³	170 ¹⁷⁰	67 ⁶⁷	178 ¹⁷⁸	277 ²⁷⁷
19.9	54.553	23.49	21.949	36.41	19.142	61.29	11.349	23.54
Mar. 1.9	54.788 ²³⁵	22.66 ⁸³	22.146 ¹⁹⁷	35.53 ⁸⁸	19.335 ¹⁹³	61.77 ⁴⁸	11.575 ²²⁶	21.12 ²⁴²
11.9	55.049 ²⁶¹	21.78 ⁸⁸	22.370 ²²⁴	34.98 ⁵⁵	19.555 ²²⁰	61.97 ²⁰	11.841 ²⁶⁶	19.14 ¹⁹⁸
21.8	55.329 ²⁸⁰	20.84 ⁹⁴	22.615 ²⁴⁵	34.74 ²⁴	19.798 ²⁴³	61.90 ⁷	12.145 ³⁰⁴	17.65 ¹⁴⁹
31.8	55.629 ³⁰⁰	19.87 ⁹⁷	22.874 ²⁵⁹	34.87 ¹³	20.054 ²⁵⁶	61.54 ³⁶	12.478 ³³³	16.78 ⁸⁷
	313 ³¹³		274 ²⁷⁴	51 ⁵¹	273 ²⁷³	65 ⁶⁵	354 ³⁵⁴	28 ²⁸
Apr. 10.8	55.942	18.88	23.148	35.38	20.327	60.89	12.832	16.50
20.8	56.266 ³²⁴	17.89 ⁹⁹	23.432 ²⁸⁴	36.22 ⁸⁴	20.612 ²⁸⁵	59.99 ⁹⁰	13.202 ³⁷⁰	16.81 ³¹
30.7	56.594 ³²⁸	16.93 ⁹⁶	23.721 ²⁸⁹	37.37 ¹¹⁵	20.903 ²⁹¹	58.85 ¹¹⁴	13.574 ³⁷²	17.74 ⁹³
May 10.7	56.922 ³²⁸	16.05 ⁸⁸	24.010 ²⁸⁹	38.79 ¹⁴²	21.193 ²⁹⁰	57.50 ¹³⁵	13.941 ³⁶⁷	19.19 ¹⁴⁵
20.7	57.244 ³²²	15.25 ⁸⁰	24.291 ²⁸¹	40.45 ¹⁶⁶	21.479 ²⁸⁶	56.01 ¹⁴⁹	14.292 ³⁵¹	21.14 ¹⁹⁵
	307 ³⁰⁷	66 ⁶⁶	266 ²⁶⁶	181 ¹⁸¹	272 ²⁷²	163 ¹⁶³	332 ³³²	240 ²⁴⁰
30.7	57.551	14.59	24.557	42.26	21.751	54.38	14.624	23.54
June 9.6	57.838 ²⁸⁷	14.07 ⁵²	24.804 ²⁴⁷	44.18 ¹⁹²	22.007 ²⁵⁶	52.74 ¹⁶⁴	14.918 ²⁹⁴	26.28 ²⁷⁴
19.6	58.096 ²⁵⁸	13.72 ³⁵	25.026 ²²²	46.17 ¹⁹⁹	22.237 ²³⁰	51.11 ¹⁶³	15.174 ²⁵⁶	29.29 ³⁰¹
29.6	58.320 ²²⁴	13.55 ¹⁷	25.214 ¹⁸⁸	48.13 ¹⁹⁶	22.435 ¹⁹⁸	49.51 ¹⁶⁰	15.382 ²⁰⁸	32.48 ³¹⁹
July 9.5	58.503 ¹⁸³	13.57 ²	25.365 ¹⁵¹	50.03 ¹⁹⁰	22.600 ¹⁶⁵	47.98 ¹⁵³	15.538 ¹⁵⁶	35.78 ³³⁰
	137 ¹³⁷	20 ²⁰	111 ¹¹¹	180 ¹⁸⁰	121 ¹²¹	138 ¹³⁸	101 ¹⁰¹	332 ³³²
19.5	58.640	13.77	25.476	51.83	22.721	46.60	15.639	39.10
29.5	58.729 ⁸⁹	14.12 ³⁵	25.542 ⁶⁶	53.51 ¹⁶⁸	22.802 ⁸¹	45.37 ¹²³	15.680 ⁴¹	42.37 ³²⁷
Aug. 8.5	58.766 ³⁷	14.62 ⁵⁰	25.568 ²⁶	54.99 ¹⁴⁸	22.836 ³⁴	44.30 ¹⁰⁷	15.665 ¹⁵	45.49 ³¹²
18.4	58.754 ¹²	15.24 ⁶²	25.547 ²¹	56.27 ¹²⁸	22.828 ⁸	43.42 ⁸⁸	15.589 ⁷⁶	48.43 ²⁹⁴
28.4	58.694 ⁶⁰	15.93 ⁶⁹	25.486 ⁶¹	57.33 ¹⁰⁶	22.775 ⁵³	42.74 ⁶⁸	15.460 ¹²⁹	51.08 ²⁶⁵
	103 ¹⁰³	73 ⁷³	101 ¹⁰¹	87 ⁸⁷	86 ⁸⁶	49 ⁴⁹	178 ¹⁷⁸	234 ²³⁴
Sept. 7.4	58.591	16.66	25.385	58.20	22.689	42.25	15.282	53.42
17.4	58.451 ¹⁴⁰	17.39 ⁷³	25.254 ¹³¹	58.79 ⁵⁹	22.566 ¹²³	41.95 ³⁰	15.063 ²¹⁹	55.40 ¹⁹⁸
27.3	58.283 ¹⁶⁸	18.07 ⁶⁸	25.100 ¹⁵⁴	59.16 ³⁷	22.418 ¹⁴⁸	41.80 ¹⁵	14.810 ²⁵³	56.95 ¹⁵⁵
Oct. 7.3	58.096 ¹⁸⁷	18.66 ⁵⁹	24.929 ¹⁷¹	59.28 ¹²	22.256 ¹⁶²	41.86 ⁶	14.534 ²⁷⁶	58.05 ¹¹⁰
17.3	57.901 ¹⁹⁵	19.16 ⁵⁰	24.752 ¹⁷⁷	59.19 ⁹	22.083 ¹⁷³	42.06 ²⁰	14.245 ²⁸⁹	58.71 ⁶⁶
	191 ¹⁹¹	38 ³⁸	175 ¹⁷⁵	33 ³³	169 ¹⁶⁹	35 ³⁵	293 ²⁹³	13 ¹³
27.2	57.710	19.54	24.577	58.86	21.914	42.41	13.952	58.84
Nov. 6.2	57.531 ¹⁷⁹	19.76 ²²	24.412 ¹⁶⁵	58.30 ⁵⁶	21.753 ¹⁶¹	42.92 ⁵¹	13.667 ²⁸⁵	58.47 ³⁷
16.2	57.376 ¹⁵⁵	19.86 ¹⁰	24.268 ¹⁴⁴	57.51 ⁷⁹	21.611 ¹⁴²	43.58 ⁶⁶	13.400 ²⁶⁷	57.58 ⁸⁹
26.2	57.253 ¹²³	19.82 ⁴	24.151 ¹¹⁷	56.53 ⁹⁸	21.495 ¹¹⁶	44.35 ⁷⁷	13.161 ²³⁹	56.20 ¹³⁸
Dec. 6.1	57.167 ⁸⁶	19.65 ¹⁷	24.062 ⁸⁹	55.34 ¹¹⁹	21.409 ⁸⁶	45.24 ⁸⁹	12.952 ²⁰⁹	54.32 ¹⁸⁸
	46 ⁴⁶	29 ²⁹	56 ⁵⁶	133 ¹³³	54 ⁵⁴	97 ⁹⁷	162 ¹⁶²	229 ²²⁹
16.1	57.121	19.36	24.006	54.01	21.355	46.21	12.790	52.03
26.1	57.118 ³	18.99 ³⁷	23.990 ¹⁶	52.53 ¹⁴⁸	21.340 ¹⁵	47.29 ¹⁰⁸	12.671 ¹¹⁹	49.38 ²⁶⁵
36.1	57.159 ⁴¹	18.54 ⁴⁵	24.008 ¹⁸	51.03 ¹⁵⁰	21.362 ²²	48.39 ¹¹⁰	12.607 ⁶⁴	46.45 ²⁸³
Mean Place	55.559	30.46	22.720	35.78	19.946	63.08	12.473	25.86
Sec δ, Tan δ	1.132	-0.530	1.008	+0.124	1.000	-0.018	1.453	+1.054
D <i>ψ</i> α, D <i>ω</i> α	+0.073	+0.017	+0.058	-0.004	+0.062	+0.001	+0.038	-0.038
D <i>ψ</i> δ, D <i>ω</i> δ	+0.20	-0.87	+0.20	-0.87	+0.21	-0.85	+0.22	-0.84

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Cephei. Mag. 4.4		ϵ Vulpeculæ. Mag. 5.4		α^2 Capricorni. Mag. 3.8		β Capricorni. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 11 s	° ' " +77 28 "	h m 20 13 s	° ' " +24 25 "	h m 20 13 s	° ' " -12 46 "	h m 20 16 s	° ' " -15 1 "
Jan. 1.1	26.57	64.20	28.145	69.04	45.584	59.65	39.779	27.76
11.0	26.20	61.01	28.155	66.70	45.628	60.03	39.820	28.00
21.0	26.02	57.63	28.206	64.32	45.705	60.37	39.896	28.18
31.0	26.02	54.18	28.293	61.98	45.819	60.60	40.007	28.28
Feb. 10.0	26.23	50.80	28.418	59.77	45.960	60.75	40.149	28.28
19.9	26.61	47.63	28.576	57.80	46.134	60.75	40.320	28.15
Mar. 1.9	27.18	44.73	28.766	56.13	46.331	60.61	40.518	27.86
11.9	27.88	42.28	28.986	54.86	46.556	60.25	40.741	27.43
21.8	28.72	40.32	29.232	51.02	46.800	59.73	40.986	26.83
31.8	29.65	38.99	29.500	53.66	47.065	59.04	41.250	26.05
Apr. 10.8	30.65	38.24	29.786	53.79	47.346	58.18	41.532	25.13
20.8	31.67	38.14	30.084	54.40	47.640	57.16	41.826	24.07
30.7	32.69	38.66	30.387	55.47	47.939	56.02	42.128	22.91
May 10.7	33.67	39.78	30.691	56.97	48.239	54.78	42.432	21.70
20.7	34.59	41.49	30.986	58.83	48.537	53.51	42.734	20.46
30.7	35.40	43.70	31.267	60.99	48.823	52.24	43.025	19.24
June 9.6	36.11	46.32	31.527	63.40	49.091	50.99	43.299	18.08
19.6	36.67	49.29	31.758	65.96	49.338	49.85	43.549	17.01
29.6	37.08	52.53	31.956	68.63	49.550	48.81	43.768	16.07
July 9.5	37.32	55.94	32.112	71.30	49.728	47.89	43.952	15.28
19.5	37.40	59.46	32.226	73.94	49.868	47.16	44.094	14.67
29.5	37.30	62.98	32.293	76.46	49.960	46.61	44.192	14.22
Aug. 8.5	37.04	66.43	32.313	78.83	50.007	46.19	44.243	13.95
18.4	36.62	69.74	32.287	80.97	50.008	45.95	44.248	13.84
28.4	36.05	72.80	32.217	82.89	49.967	45.87	44.208	13.88
Sept. 7.4	35.34	75.60	32.106	84.51	49.884	45.94	44.127	14.05
17.4	34.51	78.05	31.963	85.83	49.768	46.12	44.011	14.33
27.3	33.58	80.09	31.792	86.81	49.623	46.39	43.868	14.68
Oct. 7.3	32.58	81.69	31.602	87.43	49.462	46.71	43.704	15.08
17.3	31.52	82.75	31.401	87.70	49.289	47.10	43.531	15.51
27.2	30.44	83.30	31.202	87.57	49.119	47.53	43.358	15.95
Nov. 6.2	29.36	83.29	31.010	87.08	48.956	47.98	43.196	16.39
16.2	28.31	82.72	30.835	86.22	48.813	48.43	43.050	16.81
26.2	27.32	81.56	30.683	84.98	48.695	48.90	42.930	17.22
Dec. 6.1	26.42	79.88	30.561	83.43	48.608	49.37	42.840	17.61
16.1	25.64	77.68	30.471	81.57	48.552	49.83	42.785	17.97
26.1	24.99	75.01	30.419	79.49	48.537	50.30	42.767	18.30
36.1	24.51	71.98	30.407	77.21	48.557	50.71	42.787	18.61
Mean Place	30.688	48.67	29.413	59.04	47.026	64.28	41.237	31.97
Sec δ , Tan δ	4.614	+4.505	1.098	+0.454	1.025	-0.227	1.035	-0.268
$D\psi\alpha$, $D\omega\alpha$	-0.039	-0.163	+0.051	-0.017	+0.066	+0.008	+0.067	+0.010
$D\psi\delta$, $D\omega\delta$	+0.22	-0.84	+0.22	-0.84	+0.22	-0.83	+0.22	-0.83

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cygni. Mag. 2.3		α Pavonis. Mag. 2.1		π Capricorni. Mag. 5.2		ρ Capricorni. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 19 s	° ' " +40 0 "	h m 20 19 s	° ' " -56 58 "	h m 20 22 s	° ' " -18 27 "	h m 20 24 s	° ' " -18 3 "
Jan. 1.1	26.517	46.42	30.958	60.12	53.430	50.74	26.748	65.90
11.0	26.493 ²⁴	43.57 ²⁸⁵	30.990 ³²	57.96 ²¹⁶	53.465 ³⁵	50.76 ²	26.782 ³⁴	65.95 ⁵
21.0	26.516 ²³	40.64 ²⁹³	31.090 ¹⁰⁰	55.61 ²³⁵	53.535 ⁷⁰	50.71 ⁵	26.853 ⁷¹	65.93 ²
31.0	26.584 ⁶⁸	37.69 ²⁹⁵	31.255 ¹⁶⁵	53.24 ²³⁷	53.643 ¹⁰⁸	50.57 ¹⁴	26.958 ¹⁰⁵	65.82 ¹¹
Feb. 10.0	26.701 ¹¹⁷	34.88 ²⁸¹	31.481 ²²⁶	50.85 ²³⁹	53.782 ¹³⁹	50.33 ²⁴	27.094 ¹³⁶	65.59 ²³
19.9	26.860 ¹⁵⁹	32.29 ²⁵⁹	31.764 ²⁸³	48.52 ²³³	53.952 ¹⁷⁰	49.98 ³⁵	27.261 ¹⁶⁷	65.26 ³³
Mar. 1.9	27.063 ²⁰³	30.02 ²²⁷	32.096 ³³²	46.26 ²²⁶	54.147 ¹⁹⁵	49.49 ⁴⁹	27.455 ¹⁹⁴	64.79 ⁴⁷
11.9	27.303 ²⁴⁰	28.19 ¹⁸³	32.471 ³⁷⁵	44.15 ²¹¹	54.372 ²²⁵	48.87 ⁶²	27.676 ²²¹	64.18 ⁶¹
21.9	27.574 ²⁷¹	26.82 ¹³⁷	32.885 ⁴¹⁴	42.19 ¹⁹⁶	54.616 ²⁴⁴	48.10 ⁷⁷	27.919 ²⁴³	63.42 ⁷⁶
31.8	27.876 ³⁰²	26.02 ⁸⁰	33.334 ⁴⁴⁹	40.46 ¹⁷³	54.885 ²⁶⁹	47.21 ⁸⁹	28.184 ²⁶⁵	62.53 ⁸⁹
Apr. 10.8	28.198 ³²²	25.80 ²²	33.809 ⁴⁷⁵	38.98 ¹⁴⁸	55.170 ²⁸⁵	46.18 ¹⁰³	28.466 ²⁸²	61.51 ¹⁰²
20.8	28.536 ³³⁸	26.13 ³³	34.301 ⁴⁹²	37.78 ¹²⁰	55.466 ²⁹⁶	45.07 ¹¹¹	28.763 ²⁹⁷	60.39 ¹¹²
30.7	28.880 ³⁴⁴	27.04 ⁹¹	34.806 ⁵⁰⁵	36.88 ⁹⁰	55.774 ³⁰⁸	43.89 ¹¹⁸	29.070 ³⁰⁷	59.20 ¹¹⁹
May 10.7	29.222 ³⁴²	28.46 ¹⁴²	35.311 ⁵⁰⁵	36.33 ⁵⁵	56.085 ³¹¹	42.67 ¹²²	29.380 ³¹⁰	57.97 ¹²³
20.7	29.552 ³³⁰	30.37 ¹⁹¹	35.806 ⁴⁹⁵	36.10 ²³	56.395 ³¹⁰	41.48 ¹¹⁹	29.686 ³⁰⁶	56.76 ¹²¹
30.7	29.865 ³¹³	32.67 ²³⁰	36.283 ⁴⁷⁷	36.22 ¹²	56.692 ²⁹⁷	40.36 ¹¹²	29.985 ²⁹⁹	55.60 ¹¹⁶
June 9.6	30.152 ²⁸⁷	35.30 ²⁶³	36.732 ⁴⁴⁹	36.72 ⁵⁰	56.972 ²⁸⁰	39.29 ¹⁰⁷	30.268 ²⁸³	54.51 ¹⁰⁹
19.6	30.403 ²⁵¹	38.20 ²⁹⁰	37.137 ⁴⁰⁵	37.54 ⁸²	57.231 ²⁵⁹	38.35 ⁹⁴	30.527 ²⁵⁹	53.54 ⁹⁷
29.6	30.614 ²¹¹	41.26 ³⁰⁶	37.493 ³⁵⁶	38.70 ¹¹⁶	57.461 ²³⁰	37.55 ⁸⁰	30.757 ²³⁰	52.72 ⁸²
July 9.6	30.779 ¹⁶⁵	44.42 ³¹⁶	37.789 ²⁹⁶	40.14 ¹⁴⁴	57.653 ¹⁹²	36.95 ⁶⁰	30.950 ¹⁹³	52.08 ⁶⁴
19.5	30.892 ¹¹³	47.58 ³¹⁶	38.015 ²²⁶	41.82 ¹⁶⁸	57.803 ¹⁵⁰	36.50 ⁴⁵	31.103 ¹⁵³	51.60 ⁴⁸
29.5	30.950 ⁵⁸	50.67 ³⁰⁹	38.166 ¹⁵¹	43.72 ¹⁹⁰	57.910 ¹⁰⁷	36.24 ²⁶	31.210 ¹⁰⁷	51.32 ²⁸
Aug. 8.5	30.956 ⁶	53.67 ³⁰⁰	38.242 ⁷⁶	45.75 ²⁰³	57.968 ⁵⁸	36.15 ⁹	31.270 ⁶⁰	51.21 ¹¹
18.4	30.911 ⁴⁵	56.44 ²⁷⁷	38.237 ⁵	47.83 ²⁰⁸	57.980 ¹²	36.24 ⁹	31.283 ¹³	51.27 ⁶
28.4	30.815 ⁹⁶	58.96 ²⁵²	38.153 ⁸⁴	49.87 ²⁰⁴	57.947 ³³	36.44 ²⁰	31.250 ³³	51.49 ²²
Sept. 7.4	30.672 ¹⁴³	61.17 ²²¹	37.998 ¹⁵⁵	51.83 ¹⁹⁶	57.869 ⁷⁸	36.77 ³³	31.175 ⁷⁵	51.81 ³²
17.4	30.490 ¹⁸²	63.04 ¹⁸⁷	37.783 ²¹⁵	53.64 ¹⁸¹	57.756 ¹¹³	37.20 ⁴³	31.062 ¹¹³	52.22 ⁴¹
27.3	30.278 ²¹²	64.52 ¹⁴⁸	37.516 ²⁶⁷	55.18 ¹⁵⁴	57.616 ¹⁴⁰	37.68 ⁴⁸	30.921 ¹⁴¹	52.69 ⁴⁷
Oct. 7.3	30.042 ²³⁶	65.60 ¹⁰⁸	37.207 ³⁰⁹	56.41 ¹²³	57.453 ¹⁶³	38.19 ⁵¹	30.759 ¹⁶²	53.19 ⁵⁰
17.3	29.791 ²⁵¹	66.19 ⁵⁹	36.877 ³³⁰	57.28 ⁸⁷	57.278 ¹⁷⁵	38.72 ⁵²	30.586 ¹⁷³	53.70 ⁵¹
27.3	29.539 ²⁵²	66.35 ¹⁶	36.541 ³³⁶	57.74 ⁴⁶	57.103 ¹⁷⁵	39.20 ⁵⁸	30.411 ¹⁷⁵	54.18 ⁴⁸
Nov. 6.2	29.293 ²⁴⁶	66.02 ³³	36.218 ³²³	57.78 ⁴	56.936 ¹⁶⁷	39.63 ⁴³	30.245 ¹⁶⁶	54.63 ⁴⁵
16.2	29.060 ²³³	65.19 ⁸³	35.922 ²⁹⁶	57.39 ³⁹	56.786 ¹⁵⁰	40.01 ³⁸	30.094 ¹⁵¹	55.03 ⁴⁰
26.2	28.852 ²⁰⁸	63.89 ¹³⁰	35.667 ²⁵⁵	56.57 ⁸²	56.661 ¹²⁵	40.34 ³³	29.969 ¹²⁵	55.37 ³⁴
Dec. 6.1	28.676 ¹⁷⁶	62.15 ¹⁷⁴	35.462 ²⁰⁵	55.36 ¹²¹	56.566 ⁹⁵	40.62 ²⁸	29.873 ⁹⁶	55.66 ²⁹
16.1	28.535 ¹⁴¹	60.01 ²¹⁴	35.318 ¹⁴⁴	53.83 ¹⁵³	56.504 ⁶²	40.84 ²²	29.812 ⁶¹	55.88 ²²
26.1	28.486 ⁹⁹	57.57 ²⁴⁴	35.240 ⁷⁸	51.98 ¹⁸⁵	56.481 ²³	40.98 ¹⁴	29.787 ²⁵	56.06 ¹⁸
36.1	28.384 ⁵²	54.83 ²⁷⁴	35.235 ⁵	49.95 ²⁰³	56.493 ¹²	41.07 ⁹	29.800 ¹³	56.19 ¹³
Mean Place	27.864	34.18	33.906	59.72	54.928	54.14	28.234	69.31
Sec δ , Tan δ	1.306	+0.840	1.835	-1.539	1.054	-0.334	1.052	-0.326
$D\psi\alpha$, $D\omega\alpha$	+0.043	-0.032	+0.095	+0.059	+0.068	+0.013	+0.068	+0.013
$D\psi\delta$, $D\omega\delta$	+0.23	-0.82	+0.23	-0.82	+0.23	-0.81	+0.23	-0.81

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	41 Cygni. Mag. 4.1		θ Cephei. Mag. 4.3		ε Delphini. Mag. 4.0		Groombridge 3241. Mag. 6.4	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 26	° ' " +30 6	h m 20 28	° ' " +62 43	h m 20 29	° ' " +11 2	h m 20 30	° ' " +72 16
	s	"	s	"	s	"	s	"
Jan. 1.1	13.771	50.02	15.68	80.85	30.855	34.06	18.38	31.40
11.0	13.761	47.53	15.54	77.71	30.867	32.39	18.09	28.29
21.0	13.791	44.95	15.48	74.39	30.911	30.73	17.93	24.97
31.0	13.860	42.41	15.50	70.98	30.993	29.11	17.91	21.53
Feb. 10.0	13.969	39.96	15.60	67.62	31.104	27.61	18.02	18.12
19.9	14.116	37.72	15.79	64.46	31.248	26.30	18.26	14.84
Mar. 1.9	14.297	35.81	16.06	61.59	31.420	25.24	18.62	11.87
11.9	14.514	34.27	16.40	59.14	31.622	24.51	19.10	9.28
21.9	14.759	33.18	16.81	57.19	31.848	24.12	19.68	7.19
31.8	15.030	32.59	17.26	55.82	32.096	24.12	20.33	5.66
Apr. 10.8	15.321	32.54	17.75	55.08	32.361	24.50	21.03	4.75
20.8	15.627	33.00	18.26	54.97	32.642	25.25	21.77	4.46
30.7	15.941	33.96	18.79	55.48	32.933	26.36	22.51	4.83
May 10.7	16.257	35.38	19.30	56.62	33.225	27.79	23.25	5.81
20.7	16.566	37.21	19.80	58.33	33.515	29.48	23.99	7.37
30.7	16.861	39.42	20.26	60.54	33.798	31.39	24.60	9.46
June 9.6	17.135	41.89	20.67	63.17	34.062	33.42	25.17	11.99
19.6	17.382	44.57	21.02	66.18	34.300	35.56	25.65	14.90
29.6	17.593	47.40	21.30	69.44	34.513	37.73	26.02	18.11
July 9.6	17.762	50.27	21.51	72.89	34.687	39.86	26.28	21.52
19.5	17.886	53.13	21.64	76.43	34.821	41.94	26.43	25.06
29.5	17.964	55.91	21.68	79.98	34.915	43.88	26.45	28.64
Aug. 8.5	17.991	58.56	21.64	83.45	34.961	45.63	26.35	32.18
18.4	17.970	61.01	21.52	86.78	31.966	47.23	26.12	35.60
28.4	17.903	63.20	21.31	89.89	34.925	48.59	25.79	38.82
Sept. 7.4	17.794	65.12	21.04	92.73	34.847	49.69	25.35	41.77
17.4	17.649	66.72	20.71	95.21	34.733	50.56	24.83	44.40
27.3	17.473	67.96	20.32	97.29	34.591	51.14	24.22	46.63
Oct. 7.3	17.275	68.83	19.89	98.91	34.432	51.48	23.56	48.43
17.3	17.066	69.29	19.44	100.03	34.261	51.54	22.84	49.74
27.3	16.853	69.35	18.97	100.63	34.086	51.35	22.11	50.51
Nov. 6.2	16.645	69.00	18.50	100.67	33.918	50.91	21.37	50.72
16.2	16.453	68.23	18.05	100.15	33.761	50.19	20.64	50.36
26.2	16.282	67.06	17.63	99.06	33.629	49.23	19.95	49.42
Dec. 6.1	16.138	65.50	17.24	97.43	33.521	48.06	19.31	47.90
16.1	16.026	63.61	16.91	95.27	33.445	46.69	18.76	45.86
26.1	15.952	61.42	16.64	92.68	33.397	45.17	18.29	43.35
36.1	15.916	59.02	16.45	89.72	33.390	43.56	17.93	40.41
Mean Place	15.008	39.07	17.582	65.62	32.075	26.21	21.070	15.25
Sec δ, Tan δ	1.156	+0.580	2.183	+1.941	1.019	+0.195	3.284	+3.128
Dψa, Dωa	+0.049	-0.023	+0.020	-0.078	+0.057	-0.008	-0.005	-0.127
Dψδ, Dωδ	+0.24	-0.80	+0.24	-0.80	+0.24	-0.79	+0.24	-0.79

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Indi. Mag. 3.2		β Delphini. Mag. 3.7		ν Capricorni. Mag. 5.3		α Delphini. Mag. 3.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 32 s	° ' " -47 33 "	h m 20 33 s	° ' " +14 19 "	h m 20 35 s	° ' " -18 24 "	h m 20 36 s	° ' " +15 38 "
Jan. 1.1	7.011	41.68	55.142	43.40	38.640	35.26	2.524	31.94
11.1	7.033	40.00	55.146	41.60	38.663	35.28	2.526	30.10
21.0	7.106	38.18	55.186	39.76	38.722	35.22	2.561	28.21
31.0	7.231	36.25	55.258	37.97	38.815	35.05	2.630	26.34
Feb. 10.0	7.403	34.27	55.366	36.28	38.940	34.79	2.734	24.61
19.9	7.621	32.28	55.504	34.81	39.097	34.39	2.872	23.07
Mar. 1.9	7.878	30.31	55.673	33.60	39.280	33.85	3.037	21.79
11.9	8.172	28.39	55.870	32.70	39.492	33.16	3.234	20.83
21.9	8.502	26.55	56.094	32.17	39.730	32.34	3.457	20.25
31.8	8.859	24.85	56.340	32.06	39.988	31.37	3.704	20.09
Apr. 10.8	9.242	23.29	56.608	32.34	40.267	30.28	3.970	20.33
20.8	9.644	21.91	56.890	33.03	40.562	29.09	4.253	21.00
30.8	10.059	20.78	57.182	34.11	40.868	27.85	4.546	22.05
May 10.7	10.477	19.87	57.478	35.52	41.179	26.56	4.842	23.47
20.7	10.894	19.27	57.771	37.25	41.490	25.29	5.138	25.19
30.7	11.299	18.94	58.054	39.19	41.793	24.07	5.423	27.17
June 9.6	11.683	18.94	58.321	41.33	42.082	22.93	5.690	29.34
19.6	12.036	19.23	58.565	43.59	42.349	21.92	5.934	31.62
29.6	12.350	19.84	58.780	45.88	42.586	21.06	6.152	33.96
July 9.6	12.616	20.73	58.958	48.18	42.789	20.38	6.331	36.31
19.5	12.826	21.89	59.097	50.40	42.951	19.90	6.472	38.60
29.5	12.977	23.27	59.192	52.50	43.071	19.60	6.567	40.78
Aug. 8.5	13.062	24.81	59.240	54.47	43.142	19.50	6.615	42.80
18.5	13.084	26.45	59.246	56.21	43.166	19.58	6.624	44.60
28.4	13.041	28.17	59.207	57.74	43.144	19.80	6.585	46.19
Sept. 7.4	12.937	29.85	59.129	59.01	43.077	20.15	6.508	47.58
17.4	12.782	31.45	59.016	60.02	42.974	20.60	6.394	48.64
27.3	12.582	32.88	58.874	60.76	42.841	21.11	6.252	49.44
Oct. 7.3	12.349	34.09	58.713	61.21	42.684	21.66	6.092	49.94
17.3	12.096	35.03	58.539	61.38	42.514	22.21	5.917	50.15
27.3	11.836	35.64	58.361	61.24	42.341	22.74	5.737	50.04
Nov. 6.2	11.584	35.93	58.189	60.83	42.174	23.22	5.563	49.67
16.2	11.352	35.86	58.030	60.12	42.021	23.66	5.402	48.95
26.2	11.149	35.42	57.891	59.16	41.891	24.03	5.261	47.97
Dec. 6.2	10.987	34.67	57.778	57.92	41.789	24.33	5.144	46.72
16.1	10.873	33.60	57.694	56.48	41.720	24.55	5.056	45.25
26.1	10.808	32.30	57.642	54.84	41.685	24.72	4.998	43.59
36.1	10.800	30.74	57.626	53.08	41.686	24.80	4.980	41.79
Mean Place	9.326	40.90	56.336	35.02	40.110	38.01	3.709	23.37
Sec δ , Tan δ	1.482	-1.094	1.032	+0.255	1.054	-0.333	1.038	+0.280
$D\psi\alpha$, $D\omega\alpha$	+0.084	+0.045	+0.056	-0.011	+0.068	+0.014	+0.055	-0.012
$D\psi\delta$, $D\omega\delta$	+0.25	-0.79	+0.25	-0.78	+0.25	-0.78	+0.25	-0.78

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Pavonis. Mag. 3.6		α Cygni. (Deneb.) Mag. 1.3		δ Delphini. Mag. 4.5		ψ Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 37 s	° ' " -66 28 "	h m 20 38 s	° ' " +45 0 "	h m 20 39 s	° ' " +14 47 "	h m 20 41 s	° ' " -25 32 "
Jan. 1.1	58.26	56.21	47.088	29.59	50.681	58.90	30.805	52.90
11.1	58.23	53.63	47.027	26.74	50.679	57.10	30.823	52.51
21.0	58.30	50.84	47.015	23.76	50.712	55.27	30.879	52.00
31.0	58.45	47.98	47.053	20.71	50.779	53.47	30.970	51.38
Feb. 10.0	58.69	45.08	47.142	17.72	50.878	51.79	31.096	50.64
19.9	59.01	42.24	47.282	14.92	51.010	50.28	31.254	49.81
Mar. 1.9	59.40	39.50	47.471	12.43	51.174	49.04	31.442	48.87
11.9	59.87	36.91	47.703	10.34	51.366	48.11	31.659	47.83
21.9	60.39	34.58	47.975	8.72	51.585	47.56	31.902	46.69
31.8	60.96	32.50	48.281	7.63	51.828	47.41	32.170	45.47
Apr. 10.8	61.57	30.72	48.616	7.13	52.092	47.67	32.458	44.20
20.8	62.21	29.29	48.972	7.21	52.373	48.34	32.765	42.90
30.8	62.87	28.24	49.337	7.88	52.664	49.39	33.083	41.61
May 10.7	63.53	27.56	49.705	9.11	52.960	50.79	33.408	40.35
20.7	64.19	27.32	50.065	10.84	53.254	52.50	33.734	39.19
30.7	64.83	27.47	50.405	13.04	53.541	54.45	34.054	38.12
June 9.6	65.43	28.09	50.724	15.60	53.812	56.59	34.358	37.21
19.6	65.98	29.10	51.003	18.49	54.059	58.85	34.642	36.49
29.6	66.47	30.46	51.244	21.58	54.277	61.17	34.896	35.95
July 9.6	66.88	32.19	51.433	24.82	54.461	63.48	35.114	35.63
19.5	67.20	34.19	51.571	28.11	54.604	65.73	35.291	35.53
29.5	67.42	36.46	51.652	31.39	54.704	67.86	35.421	35.63
Aug. 8.5	67.54	38.86	51.674	34.57	54.759	69.85	35.503	35.95
18.5	67.56	41.34	51.643	37.58	54.769	71.65	35.534	36.43
28.4	67.47	43.80	51.555	40.39	54.735	73.21	35.516	37.05
Sept. 7.4	67.28	46.15	51.416	42.90	54.660	74.53	35.453	37.78
17.4	67.00	48.32	51.234	45.09	54.550	75.58	35.349	38.56
27.3	66.65	50.21	51.015	46.86	54.413	76.35	35.212	39.36
Oct. 7.3	66.23	51.76	50.768	48.23	54.253	76.85	35.049	40.13
17.3	65.78	52.86	50.503	49.16	54.080	77.05	34.872	40.83
27.3	65.31	53.50	50.230	49.59	53.903	76.95	34.690	41.45
Nov. 6.2	64.84	53.61	49.958	49.53	53.731	76.57	34.513	41.95
16.2	64.40	53.24	49.697	48.94	53.571	75.90	34.350	42.32
26.2	64.00	52.34	49.456	47.86	53.429	74.96	34.209	42.53
Dec. 6.2	63.67	50.99	49.242	46.31	53.313	73.75	34.097	42.62
16.1	63.40	49.21	49.063	44.31	53.225	72.33	34.020	42.57
26.1	63.23	47.08	48.928	41.91	53.169	70.70	33.977	42.38
36.1	63.15	44.63	48.835	39.24	53.147	68.94	33.973	42.07
Mean Place	62.305	53.51	48.388	16.16	51.849	50.49	32.386	54.22
Sec δ , Tan δ	2.506	-2.297	1.414	+1.000	1.034	+0.264	1.108	-0.478
$D\psi\alpha$, $D\omega\alpha$	+0.108	+0.097	+0.041	-0.043	+0.056	-0.011	+0.071	+0.021
$D\psi\delta$, $D\omega\delta$	+0.25	-0.77	+0.25	-0.77	+0.26	-0.77	+0.26	-0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Delphini <i>seq.</i> Mag. 4.5		ϵ Cygni. Mag. 2.6		ϵ Aquarii. Mag. 3.8		η Cephei. Mag. 3.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 43 s	° ' " +15 50 "	h m 20 43 s	° ' " +33 40 "	h m 20 43 s	° ' " - 9 46 "	h m 20 43 s	° ' " +61 32 "
Jan. 1.1	3.990	54.07	4.561	63.67	29.215	38.87	41.89	37.45
11.1	3.984	52.23	4.525	61.15	29.228	39.39	41.73	34.46
21.0	4.011	50.35	4.533	58.52	29.274	39.84	41.64	31.25
31.0	4.073	48.49	4.581	55.87	29.354	40.22	41.64	27.91
Feb. 10.0	4.170	46.74	4.671	53.30	29.464	40.45	41.71	24.58
19.9	4.299	45.17	4.802	50.93	29.605	40.54	41.87	21.42
Mar. 1.9	4.459	43.87	4.970	48.84	29.775	40.45	42.10	18.53
11.9	4.649	42.90	5.176	47.13	29.970	40.17	42.40	16.02
21.9	4.867	42.30	5.416	45.84	30.191	39.68	42.77	13.96
31.8	5.110	42.10	5.684	45.07	30.435	38.96	43.20	12.48
Apr. 10.8	5.373	42.31	5.976	44.83	30.701	38.05	43.66	11.61
20.8	5.654	42.95	6.288	45.11	30.982	36.94	44.15	11.35
30.8	5.947	43.98	6.611	45.91	31.276	35.69	44.65	11.74
May 10.7	6.244	45.36	6.940	47.23	31.575	34.32	45.16	12.74
20.7	6.541	47.07	7.263	48.97	31.876	32.87	45.65	14.32
30.7	6.829	49.03	7.575	51.12	32.170	31.38	46.11	16.41
June 9.6	7.101	51.19	7.865	53.58	32.450	29.92	46.53	18.94
19.6	7.352	53.48	8.131	56.29	32.712	28.51	46.90	21.88
29.6	7.573	55.83	8.358	59.18	32.945	27.20	47.20	25.09
July 9.6	7.759	58.19	8.547	62.16	33.145	26.04	47.43	28.52
19.5	7.905	60.48	8.690	65.16	33.306	25.04	47.59	32.06
29.5	8.008	62.68	8.785	68.10	33.425	24.21	47.67	35.65
Aug. 8.5	8.064	64.72	8.828	70.95	33.499	23.58	47.66	39.19
18.5	8.076	66.57	8.818	73.62	33.528	23.14	47.58	42.59
28.4	8.045	68.18	8.765	76.04	33.510	22.88	47.42	45.82
Sept. 7.4	7.973	69.57	8.667	78.21	33.452	22.79	47.19	48.78
17.4	7.865	70.68	8.529	80.05	33.358	22.85	46.89	51.43
27.3	7.728	71.51	8.358	81.53	33.234	23.06	46.55	53.68
Oct. 7.3	7.569	72.04	8.161	82.65	33.086	23.36	46.16	55.49
17.3	7.396	72.28	7.950	83.34	32.927	23.75	45.74	56.83
27.3	7.219	72.21	7.732	83.64	32.762	24.20	45.30	57.64
Nov. 6.2	7.045	71.85	7.515	83.47	32.601	24.70	44.86	57.93
16.2	6.882	71.19	7.309	82.87	32.452	25.25	44.43	57.63
26.2	6.739	70.25	7.122	81.84	32.325	25.81	44.02	56.76
Dec. 6.2	6.619	69.05	6.961	80.39	32.222	26.40	43.65	55.34
16.1	6.528	67.61	6.830	78.60	32.150	26.98	43.32	53.40
26.1	6.468	65.95	6.731	76.44	32.108	27.57	43.04	50.97
36.1	6.439	64.15	6.673	74.04	32.102	28.12	42.84	48.18
Mean Place	5.146	45.50	5.735	51.94	30.547	42.70	43.569	21.72
Sec δ , Tan δ	1.039	+0.284	1.202	+0.667	1.015	-0.172	2.099	+1.845
$D\psi\alpha$, $D\omega\alpha$	+0.055	-0.012	+0.048	-0.029	+0.065	+0.008	+0.024	-0.081
$D\psi\delta$, $D\omega\delta$	+0.26	-0.76	+0.26	-0.76	+0.26	-0.76	+0.26	-0.76

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	μ Aquarii. Mag. 4.8		β Indi. Mag. 3.7		220 H ¹ . Draconis. Mag. 5.6		32 Vulpeculæ. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 48	° ' - 9 16	h m 20 48	° ' -58 44	h m 20 51	° ' +80 15	h m 20 51	° ' +27 45
	s	"	s	"	s	"	s	"
Jan. 1.1	28.819	20.09	45.179	47.60	3.76	69.54	15.561	61.41
11.1	28.824	20.63	45.155	45.38	3.07	66.71	15.529	59.13
21.0	28.867	21.10	45.198	42.99	2.60	63.56	15.536	56.75
31.0	28.939	21.49	45.311	40.44	2.36	60.22	15.580	54.36
Feb. 10.0	29.045	21.75	45.487	37.85	2.38	56.84	15.663	52.05
20.0	29.180	21.85	45.725	35.25	2.64	53.52	15.782	49.91
Mar. 1.9	29.345	21.77	46.019	32.69	3.14	50.41	15.936	48.05
11.9	29.535	21.51	46.366	30.24	3.86	47.61	16.127	46.53
21.9	29.754	21.01	46.759	27.94	4.77	45.24	16.349	45.42
31.8	29.995	20.29	47.193	25.83	5.83	43.40	16.600	44.79
Apr. 10.8	30.257	19.38	47.661	23.96	7.02	42.13	16.875	44.65
20.8	30.537	18.27	48.158	22.38	8.27	41.47	17.170	44.99
30.8	30.830	17.00	48.673	21.10	9.57	41.42	17.479	45.83
May 10.7	31.129	15.62	49.199	20.16	10.86	42.02	17.792	47.12
20.7	31.431	14.15	49.722	19.60	12.09	43.19	18.105	48.84
30.7	31.726	12.65	50.235	19.42	13.23	44.93	18.408	50.89
June 9.7	32.008	11.13	50.724	19.62	14.25	47.14	18.695	53.24
19.6	32.270	9.69	51.178	20.21	15.11	49.78	18.959	55.80
29.6	32.507	8.36	51.585	21.17	15.80	52.78	19.189	58.52
July 9.6	32.709	7.15	51.933	22.48	16.30	56.06	19.383	61.31
19.5	32.875	6.09	52.214	24.08	16.60	59.50	19.535	64.10
29.5	32.998	5.22	52.419	25.95	16.68	63.05	19.639	66.83
Aug. 8.5	33.075	4.56	52.544	28.00	16.55	66.61	19.696	69.44
18.5	33.109	4.08	52.586	30.19	16.21	70.10	19.706	71.88
28.4	33.095	3.77	52.547	32.41	15.67	73.47	19.669	74.08
Sept. 7.4	33.042	3.66	52.427	34.58	14.94	76.66	19.590	76.04
17.4	32.952	3.72	52.238	36.64	14.05	79.55	19.471	77.70
27.4	32.832	3.90	51.988	38.47	13.00	82.12	19.320	79.03
Oct. 7.3	32.687	4.20	51.689	40.03	11.83	84.28	19.145	80.01
17.3	32.530	4.56	51.358	41.22	10.56	85.98	18.953	80.61
27.3	32.367	5.02	51.011	42.02	9.22	87.19	18.755	80.83
Nov. 6.2	32.205	5.53	50.665	42.37	7.85	87.85	18.559	80.66
16.2	32.056	6.07	50.335	42.26	6.48	87.95	18.371	80.09
26.2	31.927	6.65	50.039	41.69	5.14	87.44	18.201	79.13
Dec. 6.2	31.823	7.26	49.789	40.69	3.88	86.35	18.052	77.81
16.1	31.747	7.86	49.594	39.30	2.73	84.71	17.933	76.16
26.1	31.701	8.46	49.461	37.55	1.72	82.53	17.845	74.20
36.1	31.691	9.06	49.397	35.49	0.89	79.93	17.791	72.03
Mean Place	30.130	23.80	48.224	44.33	7.854	51.93	16.676	50.64
Sec δ , Tan δ	1.013	-0.163	1.928	-1.648	5.916	+5.830	1.130	+0.526
$D\psi\alpha$, $D\omega\alpha$	+0.064	+0.007	+0.094	+0.074	-0.052	-0.264	+0.051	-0.024
$D\psi\delta$, $D\omega\delta$	+0.27	-0.74	+0.27	-0.74	+0.27	-0.73	+0.27	-0.73

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Cygni. Mag. 4.0		α Octantis. Mag. 5.2		γ Microscopii. Mag. 4.7		θ Capricorni. Mag. 4.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 20 54 s	° ' " +40 52 "	h m 20 55 s	° ' " -77 18 "	h m 20 56 s	° ' " -32 33 "	h m 21 1 s	° ' " -17 32 "
Jan. 1.1	16.947 ⁶⁶	25.02 ²⁶³	19.30 ¹⁹	75.40 ²⁹⁶	32.664 ⁰	35.70 ⁸⁰	35.864 ¹	21.85 ⁵
11.1	16.881 ²²	22.39 ²⁸¹	19.11 ⁴	72.44 ³¹⁶	32.664 ⁴⁰	34.90 ⁹⁵	35.863 ³⁰	21.90 ⁵
21.0	16.859 ²⁵	19.58 ²⁸⁷	19.07 ¹⁵	69.28 ³²⁹	32.704 ⁷⁷	33.95 ¹⁰⁹	35.893 ⁶⁶	21.85 ¹⁵
31.0	16.884 ⁷¹	16.71 ²⁸⁴	19.22 ³⁰	65.99 ³³³	32.781 ¹¹⁶	32.86 ¹²¹	35.959 ⁹⁷	21.70 ²⁹
Feb. 10.0	16.955 ¹¹⁶	13.87 ²⁶⁹	19.52 ⁴⁵	62.66 ³²⁶	32.897 ¹⁵⁰	31.65 ¹³¹	36.056 ¹²⁹	21.41 ⁴⁴
20.0	17.071 ¹⁶¹	11.18 ²³⁸	19.97 ⁶¹	59.40 ³¹⁵	33.047 ¹⁸⁴	30.34 ¹³⁸	36.185 ¹⁵⁹	20.97 ⁵⁸
Mar. 1.9	17.235 ²⁰⁶	8.80 ²⁰³	20.58 ⁷³	56.25 ²⁹⁵	33.231 ²¹⁶	28.96 ¹¹⁸	36.344 ¹⁸⁸	20.39 ⁷⁵
11.9	17.441 ²⁴¹	6.77 ¹⁵⁹	21.31 ⁸⁴	53.30 ²⁷⁰	33.447 ²¹⁷	27.48 ¹⁵²	36.532 ²¹⁴	19.64 ⁹⁰
21.9	17.685 ²⁸¹	5.18 ¹¹⁰	22.15 ⁹⁵	50.60 ²³⁹	33.694 ²⁷⁵	25.96 ¹⁵⁵	36.746 ²⁴¹	18.74 ¹⁰⁵
31.9	17.966 ³⁰⁸	4.08 ⁵²	23.10 ¹⁰²	48.21 ²⁰³	33.969 ²⁰⁹	24.41 ¹⁵⁴	36.987 ²⁶³	17.69 ¹¹⁹
Apr. 10.8	18.274 ³³¹	3.56 ²	24.12 ¹¹⁰	46.18 ¹⁶³	34.268 ³¹⁹	22.87 ¹⁴⁹	37.250 ²⁸⁴	16.50 ¹³¹
20.8	18.605 ³¹⁵	3.58 ⁶⁰	25.22 ¹¹²	44.55 ¹²⁰	34.587 ³³⁴	21.38 ¹⁴³	37.534 ³⁰⁸	15.19 ¹³⁸
30.8	18.950 ³⁵¹	4.18 ¹¹⁷	26.34 ¹¹⁴	43.35 ⁷³	34.921 ³⁴⁵	19.95 ¹³²	37.834 ³⁰⁰	13.81 ¹⁴²
May 10.7	19.304 ³⁴⁷	5.35 ¹⁶³	27.48 ¹¹¹	42.62 ²⁵	35.266 ³¹⁸	18.63 ¹¹⁸	38.142 ³¹³	12.39 ¹⁴⁴
20.7	19.651 ³³¹	6.98 ²⁰⁵	28.62 ¹¹¹	42.37 ²²	35.614 ³¹³	17.45 ⁹⁹	38.455 ³¹⁰	10.95 ¹³⁸
30.7	19.985 ³¹⁸	9.03 ²¹⁵	29.73 ¹⁰⁴	42.59 ⁷⁰	35.957 ³³⁰	16.46 ⁷⁹	38.765 ²⁹⁹	9.57 ¹³⁰
June 9.7	20.303 ²⁸³	11.48 ²⁷⁰	30.77 ⁹⁷	43.29 ¹¹⁷	36.287 ³¹²	15.67 ⁵⁴	39.064 ²⁸⁰	8.27 ¹¹⁹
19.6	20.586 ²¹⁹	14.24 ²⁹⁶	31.74 ⁸⁷	44.46 ¹⁵⁹	36.599 ²⁸¹	15.13 ²⁹	39.344 ²⁵⁶	7.08 ¹⁰¹
29.6	20.835 ²⁰⁶	17.23 ³¹³	32.61 ⁷³	46.05 ¹⁹⁹	36.880 ²⁴⁵	14.84 ³	39.600 ²²²	6.07 ⁸⁴
July 9.6	21.041 ¹⁵⁴	20.36 ³¹⁸	33.34 ⁵⁸	48.04 ²³⁰	37.125 ²⁰¹	14.81 ²²	39.822 ¹⁸⁵	5.23 ⁶³
19.5	21.195 ¹⁰⁵	23.54 ³¹⁹	33.92 ⁴²	50.34 ²⁵⁸	37.326 ¹⁵⁴	15.03 ⁴⁶	40.007 ¹¹¹	4.60 ⁴²
29.5	21.300 ⁴⁸	26.73 ³⁰⁹	34.34 ²⁴	52.92 ²⁷⁴	37.480 ¹⁰²	15.49 ⁶⁸	40.151 ⁹⁶	4.18 ²²
Aug. 8.5	21.348 ³	20.82 ²⁹⁶	34.58 ⁵	55.66 ²⁸⁶	37.582 ⁴⁹	16.17 ⁸⁷	40.247 ⁴⁷	3.96 ¹
18.5	21.345 ⁵⁷	32.78 ²⁷³	34.63 ¹⁴	58.52 ²⁸³	37.631 ⁵³	17.04 ¹⁰⁰	40.294 ⁴¹	3.95 ³¹
28.4	21.288 ¹⁰⁶	35.51 ²⁴⁷	34.49 ³²	61.35 ²⁷³	37.626 ⁵³	18.04 ¹⁰⁹	40.297 ⁴¹	4.13 ³¹
Sept. 7.4	21.182 ¹⁴⁸	37.98 ²¹⁸	34.17 ⁴⁷	64.08 ²⁵¹	37.573 ⁹⁸	19.13 ¹¹²	40.256 ⁸²	4.44 ⁴⁶
17.4	21.034 ¹⁸⁶	40.16 ¹⁸⁰	33.70 ⁶³	66.59 ²²¹	37.475 ¹³⁷	20.25 ¹¹²	40.174 ¹¹⁵	4.90 ⁵⁴
27.4	20.848 ²¹⁴	41.96 ¹⁴⁰	33.07 ⁷⁵	68.80 ¹⁸⁰	37.338 ¹⁶¹	21.37 ¹⁰³	40.059 ¹⁴¹	5.44 ⁵⁹
Oct. 7.3	20.634 ²³⁴	43.36 ⁹⁹	32.32 ⁸⁴	70.60 ¹³⁴	37.174 ¹⁸⁴	22.40 ⁹³	39.918 ¹⁵⁷	6.03 ⁶²
17.3	20.400 ²⁴⁴	44.35 ⁵⁰	31.48 ⁸⁹	71.94 ⁸⁰	36.990 ¹⁹⁴	23.33 ⁷⁷	39.761 ¹⁶⁷	6.65 ⁶²
27.3	20.156 ²⁴⁵	44.85 ⁶	30.59 ⁹¹	72.74 ²³	36.796 ¹⁹¹	24.10 ⁵⁹	39.594 ¹⁶⁴	7.27 ⁵⁷
Nov. 6.2	19.911 ²³⁷	44.91 ⁴⁴	29.68 ⁸⁸	72.97 ³⁴	36.605 ¹⁸⁰	24.69 ³⁷	39.430 ¹⁵⁵	7.84 ⁵³
16.2	19.674 ²²¹	44.47 ⁹²	28.80 ⁸²	72.63 ⁹⁴	36.425 ¹⁶¹	25.06 ¹³	39.275 ¹³⁶	8.37 ⁴⁷
26.2	19.453 ¹⁹⁷	43.55 ¹³⁶	27.98 ⁷²	71.69 ¹⁴⁹	36.264 ¹³⁰	25.19 ⁸	39.139 ¹¹⁴	8.84 ³⁹
Dec. 6.2	19.256 ¹⁶⁸	42.19 ¹⁸³	27.26 ⁶⁰	70.20 ¹⁹⁸	36.134 ⁹⁹	25.11 ³⁰	39.025 ⁸⁶	9.23 ³¹
16.1	19.088 ¹³⁰	40.36 ²²⁰	26.66 ⁴⁶	68.22 ²⁴¹	36.035 ⁶¹	24.81 ⁴⁹	38.939 ⁵⁵	9.54 ²²
26.1	18.958 ⁹⁴	38.16 ²¹⁹	26.20 ²⁹	65.81 ²⁷⁶	35.974 ²²	24.32 ⁶⁹	38.884 ¹⁹	9.76 ¹³
36.1	18.864	35.67	25.91	63.05	35.952	23.63	38.865	9.89
Mean Place.	18.104	11.93	26.607	70.59	34.372	34.89	37.250	23.36
Sec δ , Tan δ	1.322	+0.865	4.555	-4.443	1.186	-0.638	1.049	-0.316
D ψ α , D ω α	+0.045	-0.040	+0.146	+0.205	+0.073	+0.030	+0.067	+0.015
D ψ δ , D ω δ	+0.27	-0.72	+0.28	-0.72	+0.28	-0.72	+0.28	-0.70

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ξ Cygni. Mag. 3.9		61 Cygni <i>pr.</i> Mag. 5.6		ν Aquarii. Mag. 4.5		Bradley 2777. Mag. 5.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 2	° ' +43 37	h m 21 3	° ' +38 22	h m 21 5	° ' -11 40	h m 21 6	° ' +77 48
	s	"	s	"	s	"	s	"
Jan. 1.1	6.636 83	26.23	25.479 53	24.46	22.773 5	60.60 38	61.39 59	70.04 272
11.1	6.553 37	23.58 265	25.426 12	22.01 215	22.768 21	60.98 31	60.80 42	67.32 308
21.0	6.516 10	20.74 281	25.414 30	19.40 266	22.792 60	61.29 19	60.38 24	64.24 328
31.0	6.526 59	17.81 293	25.444 74	16.74 261	22.852 89	61.48 7	60.14 4	60.96 338
Feb. 10.0	6.585 107	14.91 278	25.518 119	14.10 216	22.941 120	61.55 9	60.10 15	57.58 336
20.0	6.692 156	12.13 251	25.637 165	11.64 222	23.061 150	61.46 24	60.25 34	54.22 317
Mar. 1.9	6.848 202	9.62 216	25.802 205	9.42 185	23.211 176	61.22 46	60.59 53	51.05 290
11.9	7.050 244	7.46 174	26.007 242	7.57 144	23.387 209	60.76 65	61.12 68	48.15 247
21.9	7.294 282	5.72 121	26.249 278	6.13 95	23.596 231	60.11 85	61.80 82	45.68 200
31.9	7.576 315	4.51 67	26.527 307	5.18 40	23.827 255	59.26 104	62.62 93	43.68 143
Apr. 10.8	7.891 338	3.84 10	26.834 329	4.78 16	24.082 276	58.22 121	63.55 100	42.25 83
20.8	8.229 356	3.74 48	27.163 345	4.94 70	24.358 291	57.01 136	64.55 105	41.42 21
30.8	8.585 364	4.22 104	27.508 351	5.64 123	24.649 301	55.65 144	65.60 105	41.21 41
May 10.7	8.949 362	5.26 156	27.859 350	6.87 171	24.950 305	54.21 151	66.65 102	41.62 104
20.7	9.311 349	6.82 202	28.209 340	8.58 213	25.255 304	52.70 153	67.67 97	42.66 158
30.7	9.660 330	8.84 210	28.549 322	10.71 250	25.559 292	51.17 119	68.64 88	44.24 210
June 9.7	9.990 299	11.24 274	28.871 296	13.21 281	25.851 274	49.68 143	69.52 76	46.34 255
19.6	10.289 262	13.98 299	29.167 259	16.02 301	26.125 251	48.25 129	70.28 64	48.89 292
29.6	10.551 217	16.97 315	29.426 218	19.03 315	26.376 219	46.96 115	70.92 48	51.81 321
July 9.6	10.768 167	20.12 325	29.644 171	22.18 321	26.595 182	45.81 97	71.40 33	55.02 344
19.6	10.935 114	23.37 325	29.815 121	25.39 321	26.777 141	44.84 78	71.73 16	58.46 357
29.5	11.049 57	26.62 320	29.936 69	28.60 312	26.918 96	44.06 56	71.89 1	62.03 360
Aug. 8.5	11.106 0	29.82 306	30.005 16	31.72 296	27.014 50	43.50 36	71.88 19	65.63 361
18.5	11.106 53	30.021 287	30.021 35	34.68 276	27.064 4	43.14 18	71.69 34	69.24 345
28.4	11.053 104	35.75 261	29.986 82	37.44 252	27.068 38	42.96 1	71.35 50	72.69 330
Sept. 7.4	10.949 151	38.36 232	29.904 126	39.96 220	27.030 78	42.97 16	70.85 64	75.99 305
17.4	10.798 188	40.68 195	29.778 161	42.16 185	26.952 110	43.13 30	70.21 77	79.04 272
27.4	10.610 220	42.63 156	29.617 190	44.01 147	26.842 133	43.43 39	69.44 87	81.76 235
Oct. 7.3	10.390 210	44.19 112	29.427 208	45.48 104	26.709 152	43.82 47	68.57 97	84.11 190
17.3	10.150 254	45.31 67	29.219 219	46.52 60	26.557 160	44.29 53	67.60 102	86.01 141
27.3	9.896 257	45.98 18	29.000 221	47.12 13	26.397 160	44.82 55	66.58 106	87.42 87
Nov. 6.3	9.639 252	46.16 34	28.779 217	47.25 31	26.237 149	45.37 57	65.52 108	88.29 31
16.2	9.387 237	45.85 81	28.562 200	46.94 76	26.088 134	45.94 56	64.44 105	88.60 29
26.2	9.150 213	45.04 129	28.362 176	46.18 123	25.954 111	46.50 55	63.39 93	88.31 90
Dec. 6.2	8.937 186	43.75 175	28.186 150	44.95 165	25.843 87	47.05 53	62.38 93	87.41 146
16.1	8.751 151	42.00 216	28.036 116	43.30 200	25.756 56	47.58 48	61.45 83	85.95 201
26.1	8.601 110	39.84 250	27.920 78	41.30 233	25.700 24	48.06 44	60.62 69	83.94 249
36.1	8.491	37.34	27.842	38.97	25.676	48.50	59.93	81.45
Mean Place	7.763	12.51	26.578	11.89	24.064	63.09	64.298	51.94
Sec δ , Tan δ	1.381	+0.953	1.276	+0.792	1.021	-0.207	4.739	+4.632
$D\psi\alpha$, $D\omega\alpha$	+0.043	-0.045	+0.047	-0.038	+0.065	+0.010	-0.023	-0.225
$D\psi\delta$, $D\omega\delta$	+0.28	-0.70	+0.29	-0.70	+0.29	-0.69	+0.29	-0.68

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Piscis Australis. Mag. 5.6		ζ Cygni. Mag. 3.4		τ Cygni. Mag. 3.8		α Equulei. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 8 s	° ' " -27 55 "	h m 21 9 s	° ' " +29 54 "	h m 21 11 s	° ' " +37 42 "	h m 21 11 s	° ' " + 4 55 "
Jan. 1.1	42.022 ⁹	64.18 ⁵³	38.461 ⁵²	48.39 ²²¹	41.972 ⁷²	70.74 ²⁴³	57.399 ¹⁹	49.21 ¹²²
11.1	42.013 ²⁶	63.65 ⁶⁷	38.409 ¹⁷	46.15 ²³⁹	41.900 ³³	68.31 ²⁶²	57.380 ⁹	47.99 ¹²⁴
21.1	42.039 ⁶¹	62.98 ⁸²	38.392 ²³	43.76 ²¹²	41.867 ⁹	65.69 ²⁷⁰	57.389 ⁴⁴	46.75 ¹¹⁷
31.0	42.100 ⁹⁸	62.16 ⁹⁵	38.415 ⁵⁹	41.34 ²³⁸	41.876 ⁵²	62.99 ²⁶⁷	57.433 ⁷²	45.58 ¹⁰⁸
Feb. 10.0	42.198 ¹²⁹	61.21 ¹⁰⁸	38.474 ¹⁰⁰	38.96 ²²³	41.928 ⁹⁵	60.32 ²⁵⁴	57.505 ¹⁰⁵	44.50 ⁹¹
20.0	42.327 ¹⁶⁵	60.13 ¹²⁰	38.574 ¹³⁶	36.73 ¹⁹⁷	42.023 ¹³⁹	57.78 ²³¹	57.610 ¹³³	43.59 ⁶⁹
Mar. 1.9	42.492 ¹⁹⁴	58.93 ¹³¹	38.710 ¹⁷⁶	34.76 ¹⁶⁵	42.162 ¹⁸¹	55.47 ¹⁹⁷	57.743 ¹⁶⁵	42.90 ⁴⁴
11.9	42.686 ²²⁵	57.62 ¹³⁸	38.886 ²⁰⁹	33.11 ¹²⁷	42.343 ²²⁰	53.50 ¹⁵⁶	57.908 ¹⁹³	42.46 ¹³
21.9	42.911 ²⁵³	56.24 ¹⁴⁸	39.095 ²¹³	31.84 ⁷⁹	42.563 ²⁵⁷	51.94 ¹⁰⁸	58.101 ²²⁰	42.33 ¹⁸
31.9	43.164 ²⁷⁹	54.76 ¹⁵¹	39.338 ²⁶⁷	31.05 ³¹	42.820 ²⁸⁸	50.86 ⁵⁶	58.321 ²⁴¹	42.51 ⁶²
Apr. 10.8	43.443 ³⁰³	53.25 ¹⁵³	39.605 ²⁹³	30.74 ¹⁷	43.108 ³¹³	50.30 ¹	58.565 ²⁶⁶	43.03 ⁸³
20.8	43.746 ³¹⁵	51.72 ¹⁵⁰	39.898 ³¹⁰	30.91 ⁶⁹	43.421 ³³⁰	50.29 ⁵³	58.831 ²⁸²	43.86 ¹¹¹
30.8	44.061 ³³⁰	50.22 ¹⁴⁵	40.208 ³¹⁸	31.60 ¹¹⁷	43.751 ³⁴⁰	50.82 ¹⁰⁵	59.113 ²⁹³	45.00 ¹³⁹
May 10.8	44.391 ³³⁵	48.77 ¹³³	40.526 ³²³	32.77 ¹⁵⁷	44.091 ³¹³	51.87 ¹⁵³	59.406 ²⁹⁷	46.39 ¹⁶³
20.7	44.726 ³³³	47.44 ¹¹⁹	40.849 ³¹⁴	34.34 ¹⁹⁷	44.434 ³³⁴	53.40 ¹⁹⁸	59.703 ²⁹⁴	48.02 ¹⁸⁰
30.7	45.059 ³²²	46.25 ¹⁰³	41.163 ²⁹⁹	36.31 ²²⁹	44.768 ³¹⁹	55.38 ²³³	59.997 ²⁸⁵	49.82 ¹⁹²
June 9.7	45.381 ³⁰⁶	45.22 ⁸³	41.462 ²⁷⁹	38.60 ²⁵³	45.087 ²⁹²	57.71 ²⁶⁵	60.282 ²⁶⁶	51.74 ¹⁹⁷
19.6	45.687 ²⁷⁷	44.39 ⁵⁸	41.741 ²⁴⁸	41.13 ²⁷³	45.379 ²⁸¹	60.36 ²⁸⁷	60.548 ²¹¹	53.71 ¹⁹⁷
29.6	45.964 ²⁴⁵	43.81 ³¹	41.989 ²¹⁰	43.86 ²⁸¹	45.640 ²²⁰	63.23 ³⁰³	60.792 ²¹²	55.68 ¹⁹⁴
July 9.6	46.209 ²⁰⁶	43.47 ⁹	42.199 ¹⁷⁰	46.67 ²⁸⁶	45.860 ¹⁷⁵	66.26 ³¹⁰	61.004 ¹⁷⁶	57.62 ¹⁸⁴
19.6	46.415 ¹⁵⁹	43.38 ¹⁶	42.369 ¹²⁴	49.53 ²⁸⁴	46.035 ¹²⁶	69.36 ³¹¹	61.180 ¹³⁷	59.46 ¹⁷⁰
29.5	46.574 ¹¹¹	43.54 ³⁷	42.493 ⁷⁸	52.37 ²⁷⁴	46.161 ⁷⁵	72.47 ³⁰³	61.317 ⁹²	61.16 ¹⁵²
Aug. 8.5	46.685 ⁶²	43.91 ⁶⁰	42.571 ²⁷	55.11 ²⁵⁹	46.236 ²²	75.50 ²⁹¹	61.409 ⁴⁶	62.68 ¹³⁵
18.5	46.747 ¹⁰	44.51 ⁷⁵	42.598 ¹⁸	57.70 ²³⁶	46.258 ²⁹	78.41 ²⁷²	61.455 ⁴	64.03 ¹¹²
28.4	46.757 ³⁸	45.26 ⁸⁹	42.580 ⁶⁷	60.06 ²¹⁶	46.229 ⁷⁷	81.13 ²⁴⁶	61.459 ³⁷	65.15 ⁹²
Sept. 7.4	46.719 ⁸¹	46.15 ⁹⁶	42.513 ¹⁰⁵	62.22 ¹⁸³	46.152 ¹²⁰	83.59 ²¹⁷	61.422 ⁷⁴	66.07 ⁶⁸
17.4	46.638 ¹²⁰	47.11 ⁹⁸	42.408 ¹³⁹	64.05 ¹⁵¹	46.032 ¹⁵⁸	85.76 ¹⁸⁴	61.348 ¹⁰⁶	66.75 ⁴⁵
27.4	46.518 ¹¹⁸	48.09 ⁹⁹	42.269 ¹⁶¹	65.56 ¹²⁰	45.874 ¹⁸⁶	87.60 ¹¹⁷	61.242 ¹³¹	67.20 ²¹
Oct. 7.3	46.370 ¹⁶⁸	49.08 ⁸⁹	42.105 ¹⁸⁶	66.76 ⁷⁹	45.688 ²⁰⁹	89.07 ¹⁰⁶	61.111 ¹⁴⁹	67.44 ¹
17.3	46.202 ¹⁷⁹	49.97 ⁸⁰	41.919 ¹⁹⁶	67.55 ⁴³	45.479 ²²⁰	90.13 ⁶⁴	60.962 ¹⁵⁶	67.45 ¹⁹
27.3	46.023 ¹⁸⁰	50.77 ⁶⁶	41.723 ¹⁹⁸	67.98 ²	45.259 ²²⁵	90.77 ¹⁸	60.806 ¹⁵⁸	67.26 ³⁷
Nov. 6.3	45.843 ¹⁶⁹	51.43 ⁴⁸	41.525 ¹⁹³	67.96 ⁴⁰	45.034 ²²⁰	90.95 ²⁷	60.648 ¹⁵¹	66.89 ⁵⁷
16.2	45.674 ¹⁵³	51.91 ³²	41.332 ¹⁷⁸	67.56 ⁸⁰	44.814 ²⁰⁷	90.68 ⁷³	60.497 ¹³⁷	66.32 ⁷⁵
26.2	45.521 ¹²⁹	52.23 ¹²	41.154 ¹⁶¹	66.76 ¹¹⁹	44.607 ¹⁸⁸	89.95 ¹¹⁹	60.360 ¹¹⁷	65.57 ⁸⁸
Dec. 6.2	45.392 ¹⁰⁰	52.35 ⁶	40.993 ¹³⁴	65.57 ¹⁵⁷	44.419 ¹⁶²	88.76 ¹⁶⁰	60.243 ⁹⁴	64.69 ¹⁰³
16.1	45.292 ⁶⁷	52.29 ²⁴	40.859 ¹⁰⁶	64.00 ¹⁸⁵	44.257 ¹³²	87.16 ¹⁹⁸	60.149 ⁶⁶	63.66 ¹¹⁵
26.1	45.225 ³¹	52.05 ⁴¹	40.753 ⁷⁶	62.15 ²¹³	44.125 ⁹⁷	85.18 ²²⁹	60.083 ³⁹	62.51 ¹²²
36.1	45.194	51.64	40.677	60.02	44.028	82.89	60.044	61.29
Mean Place	43.582	63.33	39.489	37.17	43.001	57.95	58.500	43.41
Sec δ, Tan δ	1.132	-0.530	1.154	+0.575	1.264	+0.773	1.004	+0.086
Dψα, Dωα	+0.071	+0.026	+0.051	-0.028	+0.047	-0.038	+0.060	-0.004
Dψδ, Dωδ	+0.29	-0.68	+0.29	-0.68	+0.30	-0.67	+0.30	-0.67

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	σ Cygni. Mag. 4.3		θ^1 Microscopii. Mag. 4.9		α Cephei. Mag. 2.6		ι Capricorni. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 14 s	° ' " +39 4 "	h m 21 15 s	° ' " -41 7 "	h m 21 16 s	° ' " +62 15 "	h m 21 17 s	° ' " -17 9 "
Jan. 1.1	22.409 ⁸⁰	30.38 ²⁴⁶	48.430 ²⁸	72.92 ¹²⁴	43.28 ²²	49.09 ²⁷³	56.385 ¹⁶	47.21 ⁷
11.1	22.329 ⁴⁰	27.92 ²⁶⁴	48.402 ¹⁴	71.68 ¹⁴⁴	43.06 ¹⁵	46.36 ³⁰⁴	56.369 ¹⁴	47.28 ³
21.1	22.289 ²	25.28 ²⁷⁴	48.416 ⁵⁸	70.24 ¹⁶²	42.91 ⁷	43.32 ³²³	56.383 ⁴⁸	47.25 ¹⁸
31.0	22.291 ⁴⁹	22.54 ²⁷⁵	48.474 ⁹⁹	68.62 ¹⁷⁵	42.84 ⁰	40.09 ³³¹	56.431 ⁷⁹	47.07 ³⁰
Feb. 10.0	22.340 ⁹²	19.79 ²⁶¹	48.573 ¹³⁷	66.87 ¹⁸⁶	42.84 ¹⁰	36.78 ³²³	56.510 ¹¹²	46.77 ⁴⁵
20.0	22.432 ¹³⁵	17.18 ²³⁷	48.710 ¹⁷⁹	65.01 ¹⁹³	42.94 ¹⁷	33.55 ³⁰¹	56.622 ¹⁴⁰	46.32 ⁶²
Mar. 1.9	22.567 ¹⁷⁹	14.81 ²⁰⁶	48.889 ²¹⁶	63.08 ¹⁹⁷	43.11 ²⁵	30.51 ²⁷⁵	56.762 ¹⁷¹	45.70 ⁷⁷
11.9	22.746 ²²²	12.75 ¹⁸⁴	49.105 ²⁵¹	61.11 ¹⁹⁸	43.36 ³²	27.76 ²³²	56.933 ²⁰⁰	44.93 ⁹⁵
21.9	22.968 ²⁵⁸	11.11 ¹¹⁶	49.356 ²⁸⁴	59.13 ¹⁹⁶	43.68 ³⁹	25.44 ¹⁸²	57.133 ²²⁹	43.98 ¹¹²
31.9	23.226 ²⁹¹	9.95 ⁶³	49.640 ³¹⁵	57.17 ¹⁸³	44.07 ⁴⁴	23.62 ¹²⁹	57.362 ²⁵⁴	42.86 ¹²⁶
Apr. 10.8	23.517 ³¹⁵	9.32 ⁸	49.955 ³³⁹	55.29 ¹⁷⁹	44.51 ⁴⁹	22.33 ⁶⁶	57.616 ²⁷⁶	41.60 ¹³⁷
20.8	23.832 ³³⁵	9.24 ⁴⁷	50.294 ³⁶¹	53.50 ¹⁶²	45.00 ⁵¹	21.67 ⁵	57.892 ²⁹⁵	40.23 ¹⁴⁶
30.8	24.167 ³⁴⁵	9.71 ⁹⁹	50.655 ³⁷⁵	51.88 ¹⁴⁵	45.51 ⁵¹	21.62 ⁵⁸	58.187 ³⁰⁷	38.77 ¹⁵²
May 10.8	24.512 ³⁴⁷	10.70 ¹⁵⁰	51.030 ³⁸²	50.43 ¹²²	46.02 ⁵²	22.20 ¹¹⁷	58.494 ³¹²	37.25 ¹⁴⁸
20.7	24.859 ³³⁹	12.20 ¹⁹³	51.412 ³⁸¹	49.21 ⁹⁷	46.54 ⁵⁰	23.37 ¹⁷⁵	58.806 ³¹²	35.73 ¹⁴⁸
30.7	25.198 ³²³	14.13 ²³³	51.793 ³⁷⁰	48.24 ⁶⁷	47.04 ⁴⁶	25.12 ²²⁰	59.118 ³⁰⁴	34.25 ¹⁴¹
June 9.7	25.521 ²⁹⁹	16.46 ²⁶³	52.163 ³⁵¹	47.57 ³⁶	47.50 ⁴³	27.32 ²⁶¹	59.422 ²⁸⁸	32.84 ¹²⁸
19.6	25.820 ²⁶⁵	19.09 ²⁸³	52.514 ³²¹	47.21 ⁶	47.93 ³⁶	29.96 ³⁰⁰	59.710 ²⁶⁵	31.56 ¹¹²
29.6	26.085 ²²⁴	21.97 ³⁰⁴	52.838 ²⁸⁵	47.15 ²⁷	48.29 ³⁰	32.96 ³²⁷	59.975 ²³⁴	30.44 ⁹³
July 9.6	26.309 ¹⁷⁹	25.01 ³¹³	53.123 ²⁴¹	47.42 ⁵⁸	48.59 ²²	36.23 ³⁴⁶	60.209 ¹⁹⁹	29.51 ⁷³
19.6	26.488 ¹²⁹	28.14 ³¹⁴	53.364 ¹⁸⁹	48.00 ⁸⁰	48.81 ¹⁵	39.69 ³⁵⁵	60.408 ¹⁵⁶	28.78 ⁴⁹
29.5	26.617 ⁷⁷	31.28 ³⁰⁸	53.553 ¹³¹	48.86 ¹¹¹	48.96 ⁶	43.24 ³⁵⁹	60.564 ¹¹²	28.29 ²⁸
Aug. 8.5	26.694 ²⁴	34.36 ²⁹⁴	53.687 ⁷⁵	49.97 ¹³¹	49.02 ¹	46.83 ³⁵²	60.676 ⁶⁵	28.01 ⁶
18.5	26.718 ²⁸	37.30 ²⁷⁷	53.762 ¹⁷	51.28 ¹⁴⁶	49.01 ¹⁰	50.35 ³⁴⁰	60.741 ¹⁸	27.95 ¹³
28.5	26.690 ⁷⁷	40.07 ²⁵²	53.779 ⁴⁰	52.71 ¹⁵⁵	48.91 ¹⁷	53.75 ³¹⁹	60.759 ²⁶	28.08 ³¹
Sept. 7.4	26.613 ¹²¹	42.59 ²²³	53.739 ⁹²	54.29 ¹⁵⁷	48.74 ²⁴	56.94 ²⁹¹	60.733 ⁶⁸	28.39 ⁴⁵
17.4	26.492 ¹⁵⁸	44.82 ¹⁹⁰	53.647 ¹³⁷	55.86 ¹⁵²	48.50 ³¹	59.85 ²⁶²	60.665 ¹⁰¹	28.84 ⁵⁶
27.4	26.334 ¹⁹⁰	46.72 ¹⁵²	53.510 ¹⁷⁴	57.38 ¹⁴¹	48.19 ³⁵	62.17 ²¹⁹	60.564 ¹³⁰	29.40 ⁶²
Oct. 7.3	26.144 ²¹¹	48.24 ¹¹¹	53.336 ²⁰⁰	58.79 ¹²²	47.84 ³⁹	64.66 ¹⁷¹	60.434 ¹⁵⁰	30.02 ⁶⁷
17.3	25.933 ²²⁶	49.35 ⁶⁸	53.136 ²¹⁵	60.01 ¹⁰⁰	47.45 ⁴²	66.40 ¹²⁶	60.284 ¹⁵⁹	30.69 ⁶⁶
27.3	25.707 ²²⁹	50.03 ²¹	52.921 ²¹⁸	61.01 ⁷³	47.03 ⁴³	67.66 ⁷¹	60.125 ¹⁶²	31.35 ⁶³
Nov. 6.3	25.478 ²²⁷	50.27 ²¹	52.703 ²¹⁰	61.74 ⁴³	46.60 ⁴⁴	68.37 ¹⁹	59.963 ¹⁵⁵	31.98 ⁵⁸
16.2	25.251 ²¹⁵	50.03 ⁷²	52.493 ¹⁹³	62.17 ¹⁰	46.16 ⁴³	68.56 ⁴³	59.808 ¹⁴⁰	32.56 ⁵¹
26.2	25.036 ¹⁹⁵	49.31 ¹¹⁷	52.300 ¹⁶⁵	62.27 ²²	45.73 ³⁶	68.13 ¹⁰⁰	59.668 ¹¹⁹	33.07 ⁴⁴
Dec. 6.2	24.841 ¹⁷⁰	48.14 ¹⁶¹	52.135 ¹³²	62.05 ⁵¹	45.33 ³³	67.13 ¹⁵³	59.549 ⁹⁴	33.51 ³⁶
16.2	24.671 ¹⁴⁰	46.53 ¹⁹⁷	52.003 ⁹⁵	61.54 ⁸²	44.97 ²⁶	65.60 ²⁰⁴	59.455 ⁶⁵	33.87 ²⁶
26.1	24.531 ¹⁰³	44.56 ²³¹	51.908 ⁵²	60.72 ¹⁰⁶	44.64 ²⁶	63.56 ²⁵²	59.390 ³⁶	34.13 ¹⁶
36.1	24.428 ¹⁰³	42.25 ²³¹	51.856 ⁵²	59.66 ¹⁰⁶	44.38 ²⁶	61.04 ²⁵²	59.354 ³⁶	34.29 ¹⁶
Mean Place	23.431	17.31	50.346	69.36	44.630	32.23	57.712	47.91
Sec δ , Tan δ	1.288	+0.812	1.328	-0.873	2.148	+1.902	1.047	-0.309
$D\psi\alpha$, $D\omega\alpha$	+0.047	-0.041	+0.076	+0.044	+0.028	-0.096	+0.066	+0.016
$D\psi\delta$, $D\omega\delta$	+0.30	-0.66	+0.30	-0.66	+0.30	-0.65	+0.30	-0.65

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	1 Pegasi. Mag. 4.2		γ Pavonis. Mag. 4.3		ζ Capricorni. Mag. 3.9		ζ Cygni. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 18 s	° ' " +19 28 "	h m 21 20 s	° ' " -65 42 "	h m 21 22 s	° ' " -22 44 "	h m 21 26 s	° ' " +46 11 "
Jan. 1.1	30.511 40	36.62 185	2.09 12	64.25 243	15.061 21	45.15 22	35.443 119	76.58 250
11.1	30.471 9	34.77 191	1.97 4	61.82 270	15.040 12	44.93 38	35.324 74	74.08 275
21.1	30.462 23	32.86 192	1.93 4	59.12 288	15.052 43	44.55 53	35.250 27	71.33 289
31.0	30.485 61	30.94 185	1.97 21	56.24 302	15.095 77	44.02 61	35.223 23	68.44 293
Feb. 10.0	30.546 90	29.09 170	2.10 21	53.22 305	15.172 112	43.38 80	35.246 71	65.51 285
20.0	30.636 126	27.39 149	2.31 29	50.17 302	15.284 140	42.58 95	35.320 126	62.66 265
Mar. 1.9	30.762 159	25.90 120	2.60 35	47.15 294	15.424 171	41.63 111	35.446 178	60.01 235
11.9	30.921 193	24.70 82	2.95 42	44.21 280	15.598 204	40.52 121	35.624 225	57.66 195
21.9	31.114 223	23.88 41	3.37 49	41.41 259	15.802 239	39.28 139	35.849 270	55.71 147
31.9	31.337 248	23.47 0	3.86 53	38.82 233	16.036 254	37.89 111	36.119 309	54.24 93
Apr. 10.8	31.585 271	23.47 42	4.39 57	36.49 202	16.295 282	36.45 152	36.428 310	53.31 37
20.8	31.856 291	23.89 85	4.96 61	34.47 168	16.577 302	34.93 151	36.768 362	52.94 20
30.8	32.147 301	24.74 125	5.57 64	32.79 128	16.879 315	33.39 155	37.130 375	53.14 76
May 10.8	32.448 305	25.99 161	6.21 64	31.51 88	17.194 322	31.84 119	37.505 380	53.90 131
20.7	32.753 305	27.60 189	6.85 63	30.63 41	17.516 323	30.35 143	37.885 373	55.21 180
30.7	33.058 290	29.49 216	7.48 62	30.19 2	17.839 315	28.92 126	38.258 355	57.01 223
June 9.7	33.348 273	31.65 234	8.10 58	30.21 45	18.154 299	27.66 108	38.613 330	59.24 261
19.6	33.621 250	33.99 245	8.68 54	30.66 90	18.453 276	26.58 92	38.943 293	61.85 289
29.6	33.871 215	36.44 250	9.22 47	31.56 131	18.729 216	25.66 65	39.236 250	64.74 312
July 9.6	34.086 176	38.94 218	9.69 39	32.87 167	18.975 208	25.01 45	39.486 202	67.86 325
19.6	34.262 137	41.42 242	10.08 30	34.54 197	19.183 166	24.56 19	39.688 146	71.11 331
29.5	34.399 90	43.84 228	10.38 22	36.51 226	19.349 120	24.37 3	39.834 89	74.42 330
Aug. 8.5	34.489 47	46.12 213	10.60 10	38.77 212	19.469 73	24.40 26	39.923 32	77.72 321
18.5	34.536 0	48.25 193	10.70 1	41.19 252	19.542 23	24.66 48	39.955 25	80.93 305
28.5	34.536 39	50.18 168	10.71 10	43.71 250	19.565 22	25.14 58	39.930 78	83.98 284
Sept. 7.4	34.497 81	51.86 141	10.61 18	46.21 241	19.543 68	25.72 74	39.852 129	86.82 256
17.4	34.416 116	53.27 116	10.43 28	48.62 221	19.475 101	26.46 81	39.723 172	89.38 223
27.4	34.300 139	54.43 82	10.15 34	50.83 194	19.374 133	27.27 84	39.551 207	91.61 188
Oct. 7.3	34.161 158	55.25 52	9.81 40	52.77 156	19.241 150	28.11 82	39.344 234	93.49 144
17.3	34.003 169	55.77 21	9.41 43	54.33 114	19.091 166	28.93 82	39.110 253	94.93 99
27.3	33.834 172	55.98 11	8.98 45	55.47 64	18.925 167	29.75 69	38.857 262	95.92 51
Nov. 6.3	33.662 167	55.87 44	8.53 44	56.11 13	18.758 164	30.44 59	38.595 262	96.43 1
16.2	33.495 154	55.43 75	8.09 42	56.24 39	18.594 147	31.03 44	38.333 252	96.44 51
26.2	33.341 137	54.68 105	7.67 38	55.85 90	18.447 127	31.47 34	38.081 237	95.93 101
Dec. 6.2	33.204 116	53.63 133	7.29 31	54.95 139	18.320 101	31.81 17	37.844 211	94.92 149
16.2	33.088 91	52.30 156	6.98 25	53.56 183	18.219 74	31.98 3	37.633 183	93.43 193
26.1	32.997 61	50.74 175	6.73 17	51.73 222	18.145 39	32.01 11	37.450 145	91.50 230
36.1	32.936	48.99	6.56	49.51	18.106	31.90	37.305	89.20
Mean Place	31.509	27.67	5.838	57.47	16.470	44.44	36.419	62.04
Sec δ, Tan δ	1.061	+0.354	2.431	-2.216	1.084	-0.419	1.445	+1.043
Dψα, Dωα	+0.055	-0.018	+0.099	+0.113	+0.068	+0.022	+0.044	-0.055
Dψδ, Dωδ	+0.30	-0.65	+0.30	-0.64	+0.31	-0.64	+0.31	-0.62

APPARENT PLACES OF STARS, 1923.

491

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	β Aquarii. Mag. 3.1		β Cephei. Mag. 3.3		ξ Aquarii. Mag. 4.8		74 Cygni. Mag. 5.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 27 s	° ' " — 5 54 "	h m 21 27 s	° ' " +70 13 "	h m 21 33 s	° ' " — 8 11 "	h m 21 33 s	° ' " +40 3 "
Jan. 1.1	29.256	35.84	38.87	38.99	38.116	58.95	50.812	74.56
11.1	29.232	36.52	38.50	36.38	38.085	59.49	50.712	72.22
21.1	29.232	37.12	38.23	33.43	38.082	59.95	50.648	69.65
31.0	29.268	37.62	38.06	30.23	38.111	60.32	50.626	66.96
Feb. 10.0	29.330	38.00	38.01	26.89	38.170	60.55	50.648	64.23
20.0	29.426	38.22	38.07	23.54	38.259	60.61	50.716	61.61
Mar. 2.0	29.548	38.24	38.25	20.32	38.380	60.48	50.829	59.16
11.9	29.705	38.06	38.55	17.39	38.530	60.18	50.989	57.02
21.9	29.886	37.65	38.95	14.84	38.708	59.62	51.193	55.28
31.9	30.099	36.97	39.44	12.76	38.917	58.84	51.434	53.96
Apr. 10.8	30.336	36.07	40.01	11.22	39.152	57.83	51.716	53.16
20.8	30.597	34.93	40.64	10.27	39.411	56.62	52.025	52.90
30.8	30.878	33.60	41.31	9.92	39.691	55.24	52.357	53.18
May 10.8	31.173	32.12	41.99	10.20	39.985	53.70	52.705	53.99
20.7	31.472	30.51	42.67	11.11	40.288	52.08	53.059	55.31
30.7	31.774	28.80	43.33	12.60	40.591	50.40	53.408	57.11
June 9.7	32.067	27.09	43.95	14.60	40.889	48.72	53.745	59.31
19.7	32.346	25.43	44.50	17.07	41.173	47.10	54.061	61.83
29.6	32.604	23.80	44.99	19.94	41.436	45.55	54.342	64.60
July 9.6	32.834	22.32	45.38	23.12	41.673	44.14	54.591	67.60
19.6	33.028	20.98	45.68	26.54	41.874	42.91	54.791	70.72
29.5	33.182	19.81	45.87	30.12	42.035	41.84	54.943	73.91
Aug. 8.5	33.296	18.87	45.96	33.75	42.157	41.01	55.044	77.02
18.5	33.363	18.10	45.94	37.40	42.231	40.37	55.091	80.06
28.5	33.390	17.56	45.81	40.93	42.264	39.97	55.087	82.92
Sept. 7.4	33.370	17.22	45.58	44.31	42.249	39.77	55.033	85.60
17.4	33.312	17.11	45.26	47.46	42.198	39.75	54.933	87.97
27.4	33.219	17.15	44.85	50.29	42.111	39.88	54.792	90.04
Oct. 7.4	33.102	17.33	44.37	52.78	41.997	40.17	54.616	91.75
17.3	32.964	17.63	43.83	54.83	41.863	40.57	54.418	93.06
27.3	32.813	18.08	43.24	56.38	41.716	41.08	54.201	93.97
Nov. 6.3	32.661	18.60	42.63	57.41	41.564	41.64	53.974	94.41
16.2	32.514	19.20	42.00	57.89	41.417	42.26	53.749	94.37
26.2	32.378	19.84	41.38	57.77	41.280	42.90	53.527	93.87
Dec. 6.2	32.260	20.52	40.78	57.04	41.161	43.55	53.324	92.91
16.2	32.163	21.23	40.22	55.76	41.063	44.22	53.142	91.51
26.1	32.093	21.94	39.72	53.89	40.990	44.84	52.984	89.69
36.1	32.047	22.65	39.29	51.54	40.941	45.44	52.862	87.50
Mean Place	30.400	38.61	40.438	20.91	39.261	60.90	51.713	61.16
Sec δ , Tan δ	1.005	-0.104	2.956	+2.782	1.010	-0.144	1.307	+0.841
$D\psi\alpha$, $D\omega\alpha$	+0.063	+0.005	+0.016	-0.146	+0.063	+0.008	+0.048	-0.045
$D\psi\delta$, $D\omega\delta$	+0.31	-0.62	+0.31	-0.62	+0.32	-0.60	+0.32	-0.60

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Capricorni. Mag. 3.8		ϵ Pegasi. Mag. 2.5		11 Cephei. Mag. 4.8		δ Capricorni. Mag. 3.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 35 s	° ' " -17 0 "	h m 21 40 s	° ' " + 9 31 "	h m 21 40 s	° ' " +70 57 "	h m 21 42 s	° ' " -16 28 "
Jan. 1.1	48.379 31	38.99 10	23.280 47	22.72 133	46.55 41	42.30 246	46.355 37	39.22 13
11.1	48.348 2	39.09 3	23.233 18	21.39 141	46.14 32	39.84 284	46.318 8	39.35 0
21.1	48.346 30	39.06 19	23.215 11	19.98 135	45.82 21	37.00 314	46.310 22	39.35 15
31.0	48.376 61	38.87 32	23.226 43	18.63 126	45.61 10	33.86 328	46.332 53	39.20 27
Feb. 10.0	48.437 90	38.55 47	23.269 73	17.37 113	45.51 3	30.58 333	46.385 83	38.91 46
20.0	48.527 123	38.08 66	23.342 107	16.24 92	45.54 15	27.25 323	46.468 116	38.45 64
Mar. 2.0	48.650 154	37.42 83	23.449 137	15.32 66	45.69 27	24.02 299	46.584 146	37.81 81
11.9	48.804 184	36.59 100	23.586 170	14.66 38	45.96 37	21.03 266	46.730 178	37.00 99
21.9	48.988 214	35.59 118	23.756 200	14.28 2	46.33 49	18.37 222	46.908 207	36.01 117
31.9	49.202 211	34.41 133	23.956 230	14.26 32	46.82 57	16.15 169	47.115 237	34.84 133
Apr. 10.9	49.443 267	33.08 145	24.186 254	14.58 68	47.39 63	14.46 112	47.352 262	33.51 146
20.8	49.710 286	31.63 154	24.440 275	15.26 103	48.02 68	13.34 50	47.614 284	32.05 155
30.8	49.996 303	30.09 160	24.715 290	16.29 128	48.70 70	12.84 11	47.898 300	30.50 163
May 10.8	50.299 312	28.49 162	25.005 297	17.57 160	49.40 71	12.95 73	48.198 310	28.87 163
20.7	50.611 315	26.87 158	25.302 301	19.17 183	50.11 70	13.68 131	48.508 315	27.24 162
30.7	50.926 308	25.29 149	25.603 293	21.00 198	50.81 65	14.99 185	48.823 310	25.62 153
June 9.7	51.234 296	23.80 138	25.896 282	22.98 209	51.46 60	16.84 233	49.133 279	24.09 142
19.7	51.530 276	22.42 120	26.178 260	25.07 215	52.06 52	19.17 276	49.432 299	22.67 125
29.6	51.806 247	21.22 102	26.438 230	27.22 215	52.58 44	21.93 309	49.711 251	21.42 107
July 9.6	52.053 213	20.20 79	26.668 201	29.37 209	53.02 34	25.02 334	49.962 217	20.35 85
19.6	52.266 173	19.41 57	26.869 158	31.46 197	53.36 24	28.36 354	50.179 179	19.50 61
29.6	52.439 128	18.84 33	27.027 116	33.43 183	53.60 12	31.90 364	50.358 135	18.89 37
Aug. 8.5	52.567 82	18.51 11	27.143 72	35.26 166	53.72 1	35.54 365	50.493 90	18.52 15
18.5	52.649 36	18.40 11	27.215 30	36.92 145	53.73 9	39.19 360	50.583 43	18.37 9
28.5	52.685 9	18.51 31	27.245 15	38.37 120	53.64 20	42.79 346	50.626 3	18.46 26
Sept. 7.4	52.676 50	18.82 45	27.230 52	39.57 100	53.44 29	46.25 326	50.623 44	18.72 45
17.4	52.626 88	19.27 58	27.178 82	40.57 75	53.15 39	49.51 276	50.579 82	19.17 56
27.4	52.538 117	19.85 66	27.096 116	41.32 47	52.76 48	52.47 263	50.497 110	19.73 67
Oct. 7.4	52.421 139	20.51 72	26.980 135	41.79 27	52.28 53	55.10 222	50.387 134	20.40 72
17.3	52.282 151	21.23 71	26.845 146	42.06 1	51.75 58	57.32 176	50.253 148	21.12 73
27.3	52.131 157	21.94 69	26.699 153	42.05 24	51.17 62	59.08 124	50.105 153	21.85 73
Nov. 6.3	51.974 153	22.63 65	26.546 151	41.81 44	50.55 64	60.32 69	49.952 151	22.58 68
16.3	51.821 142	23.28 57	26.395 142	41.37 65	49.91 65	61.01 51	49.801 143	23.26 60
26.2	51.679 124	23.85 50	26.253 127	40.72 86	49.26 62	61.10 110	49.658 126	23.86 53
Dec. 6.2	51.555 103	24.35 40	26.126 111	39.86 104	48.64 60	60.59 110	49.532 108	24.39 43
16.2	51.452 77	24.75 29	26.015 89	38.82 118	48.04 54	59.49 167	49.426 80	24.82 34
26.1	51.375 49	25.04 17	25.926 61	37.64 132	47.50 47	57.82 219	49.346 54	25.16 22
36.1	51.326	25.21	25.865	36.32	47.03	55.63	49.292	25.38
Mean Place	49.636	38.80	24.230	16.58	47.934	23.81	47.579	38.74
Sec δ , Tan δ	1.046	-0.306	1.014	+0.168	3.065	+2.898	1.043	-0.296
$D\psi\alpha$, $D\omega\alpha$	+0.066	+0.016	+0.059	-0.009	+0.017	-0.159	+0.066	+0.016
$D\psi\delta$, $D\omega\delta$	+0.32	-0.59	+0.33	-0.57	+0.33	-0.57	+0.33	-0.56

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	π^3 Cygni. Mag. 4.3		μ Capricorni. Mag. 5.2		γ Gruis. Mag. 3.2		16 Pegasi. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 43 s	° ' " +48 57 "	h m 21 49 s	° ' " -13 54 "	h m 21 49 s	° ' " -37 43 "	h m 21 49 s	° ' " +25 33 "
Jan. 1.1	55.967	25.33	4.818	54.49	14.581	45.66	32.637	54.57
11.1	55.818	22.94	4.773	54.73	14.522	44.73	32.558	52.70
21.1	55.710	20.24	4.759	54.86	14.497	43.54	32.514	50.67
31.0	55.651	17.35	4.773	54.86	14.509	42.13	32.500	48.59
Feb. 10.0	55.646	14.39	4.818	54.72	14.562	40.52	32.521	46.52
20.0	55.692	11.49	4.896	54.39	14.652	38.76	32.578	44.54
Mar. 2.0	55.799	8.72	5.003	53.89	14.780	36.86	32.672	42.76
11.9	55.958	6.23	5.143	53.19	14.947	34.88	32.804	41.24
21.9	56.171	4.09	5.312	52.30	15.149	32.83	32.969	40.04
31.9	56.435	2.42	5.514	51.21	15.388	30.74	33.173	39.25
Apr. 10.9	56.742	1.26	5.743	49.94	15.661	28.67	33.412	38.91
20.8	57.087	0.63	5.999	48.53	15.963	26.64	33.677	39.01
30.8	57.456	0.60	6.278	46.99	16.292	24.72	33.964	39.57
May 10.8	57.846	1.13	6.572	45.36	16.612	22.95	34.269	40.57
20.7	58.243	2.24	6.880	43.69	17.005	21.37	34.585	41.97
30.7	58.636	3.85	7.191	42.00	17.373	20.01	34.903	43.75
June 9.7	59.016	5.93	7.499	40.37	17.738	18.93	35.212	45.82
19.7	59.372	8.11	7.795	38.87	18.090	18.12	35.506	48.16
29.6	59.692	11.19	8.074	37.47	18.421	17.66	35.781	50.68
July 9.6	59.969	14.26	8.326	36.27	18.721	17.51	36.023	53.30
19.6	60.196	17.49	8.541	35.25	18.984	17.71	36.229	55.98
29.6	60.371	20.83	8.726	34.46	19.202	18.23	36.396	58.64
Aug. 8.5	60.487	24.20	8.865	33.92	19.368	19.03	36.516	61.25
18.5	60.542	27.51	8.960	33.59	19.480	20.09	36.592	63.72
28.5	60.537	30.75	9.007	33.51	19.536	21.37	36.620	66.03
Sept. 7.4	60.475	33.74	9.012	33.64	19.538	22.80	36.607	68.10
17.4	60.361	36.49	8.974	33.90	19.488	24.32	36.549	69.91
27.4	60.203	38.96	8.899	34.36	19.393	25.87	36.454	71.48
Oct. 7.4	60.002	41.06	8.794	34.91	19.256	27.38	36.332	72.70
17.3	59.769	42.76	8.664	35.55	19.091	28.76	36.183	73.63
27.3	59.512	44.00	8.524	36.23	18.905	29.98	36.019	74.18
Nov. 6.3	59.241	44.77	8.374	36.92	18.710	31.00	35.847	74.40
16.3	58.967	45.02	8.226	37.59	18.515	31.72	35.674	74.23
26.2	58.698	44.76	8.086	38.24	18.328	32.15	35.507	73.70
Dec. 6.2	58.438	43.96	7.961	38.83	18.160	32.28	35.350	72.85
16.2	58.201	42.69	7.854	39.33	18.015	32.11	35.211	71.64
26.1	57.989	40.91	7.771	39.75	17.900	31.62	35.094	70.14
36.1	57.814	38.72	7.714	40.09	17.820	30.87	34.999	68.41
Mean Place	56.829	10.09	5.976	54.28	16.252	40.13	33.454	44.52
Sec δ , Tan δ	1.523	+1.149	1.030	-0.248	1.264	-0.774	1.108	+0.478
$D\psi\alpha$, $D\omega\alpha$	+0.044	-0.063	+0.065	+0.014	+0.072	+0.043	+0.054	-0.027
$D\psi\delta$, $D\omega\delta$	+0.33	-0.56	+0.33	-0.54	+0.33	-0.54	+0.34	-0.54

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	79 Draconis. Mag. 6.6		20 Pegasi. Mag. 5.7		ε Indi. Mag. 4.7		α Aquarii. Mag. 3.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 21 51	° ' " +73 20	h m 21 57	° ' " +12 44	h m 21 57	° ' " -57 5	h m 22 1	° ' " - 0 41
	s	"	s	"	s	"	s	"
Jan. 1.1	52.22	34.99	19.406	68.21	26.159	80.90	48.845	37.32
11.1	51.71	32.67	19.345	66.81	26.038	79.16	48.792	38.17
21.1	51.31	29.92	19.310	65.34	25.972	77.08	48.762	38.99
31.1	51.02	26.86	19.303	63.87	25.964	74.74	48.758	39.73
Feb. 10.0	50.86	23.60	19.326	62.46	26.015	72.19	48.785	40.36
20.0	50.85	20.27	19.380	61.17	26.124	69.50	48.841	40.85
Mar. 2.0	50.97	17.01	19.467	60.08	26.290	66.72	48.928	41.14
11.9	51.23	13.94	19.588	59.22	26.513	63.91	49.048	41.19
21.9	51.63	11.17	19.743	58.68	26.789	61.15	49.200	41.01
31.9	52.14	8.82	19.929	58.48	27.119	58.47	49.380	40.53
Apr. 10.9	52.76	6.98	20.148	58.63	27.496	55.95	49.595	39.79
20.8	53.45	5.70	20.395	59.16	27.915	53.63	49.837	38.78
30.8	54.20	4.98	20.664	60.04	28.371	51.57	50.100	37.52
May 10.8	54.99	4.90	20.952	61.27	28.857	49.82	50.383	36.05
20.8	55.79	5.44	21.251	62.81	29.360	48.41	50.680	34.40
30.7	56.58	6.58	21.555	64.59	29.873	47.38	50.980	32.61
June 9.7	57.32	8.26	21.856	66.58	30.383	46.76	51.280	30.75
19.7	58.00	10.44	22.145	68.72	30.877	46.58	51.570	28.84
29.6	58.61	13.06	22.416	70.95	31.345	46.83	51.842	26.98
July 9.6	59.13	16.06	22.659	73.20	31.771	47.52	52.093	25.20
19.6	59.54	19.33	22.870	75.42	32.146	48.62	52.309	23.54
29.6	59.83	22.83	23.013	77.55	32.461	50.10	52.490	22.02
Aug. 8.5	60.00	26.45	23.174	79.57	32.705	51.90	52.633	20.69
18.5	60.05	30.12	23.262	81.42	32.874	53.97	52.731	19.59
28.5	59.97	33.78	23.308	83.06	32.966	56.24	52.785	18.66
Sept. 7.5	59.77	37.31	23.309	84.50	32.978	58.62	52.797	18.00
17.4	59.46	40.67	23.271	85.68	32.916	61.04	52.771	17.56
27.4	59.05	43.79	23.196	86.62	32.785	63.38	52.706	17.30
Oct. 7.4	58.54	46.60	23.094	87.30	32.593	65.56	52.616	17.26
17.3	57.95	48.99	22.968	87.73	32.351	67.51	52.499	17.40
27.3	57.30	50.93	22.828	87.89	32.076	69.12	52.366	17.69
Nov. 6.3	56.60	52.37	22.679	87.80	31.780	70.34	52.226	18.14
16.3	55.87	53.25	22.529	87.45	31.477	71.12	52.086	18.69
26.2	55.11	53.56	22.384	86.87	31.181	71.43	51.948	19.34
Dec. 6.2	54.40	53.25	22.250	86.05	30.907	71.27	51.823	20.08
16.2	53.71	52.33	22.133	85.03	30.667	70.62	51.712	20.88
26.2	53.06	50.83	22.033	83.83	30.467	69.53	51.620	21.72
36.1	52.49	48.82	21.957	82.48	30.317	68.03	51.553	22.59
Mean Place	53.545	16.04	20.249	61.63	28.739	71.60	49.786	40.03
Sec δ, Tan δ	3.488	+3.342	1.025	+0.226	1.841	-1.546	1.000	-0.012
Dψα, Dωα	+0.014	-0.189	+0.058	-0.013	+0.082	+0.089	+0.061	+0.001
Dψδ, Dωδ	+0.34	-0.53	+0.34	-0.51	+0.34	-0.51	+0.35	-0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	♈ Aquarii. Mag. 4.4		20 Cephei. Mag. 5.4		♋ Gruis. Mag. 2.2		♊ Pegasi. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 2	° ' -14 14	h m 22 2	° ' +62 24	h m 22 3	° ' -47 19	h m 22 3	° ' +24 58
	s	"	s	"	s	"	s	"
Jan. 1.1	15.708 ⁵³	39.02 ²⁵	39.26 ²⁹	52.08 ²²⁷	21.258 ⁹⁹	73.87 ¹³⁴	24.791 ⁸⁶	16.06 ¹⁷⁶
11.1	15.655 ²⁶	39.27 ¹¹	38.97 ²³	49.81 ²⁶⁷	21.159 ⁵⁹	72.53 ¹⁶⁴	24.705 ⁵⁶	14.30 ¹⁹²
21.1	15.629 ²	39.38 ³	38.74 ¹⁶	47.14 ²⁹⁶	21.100 ¹¹	70.89 ¹⁹⁰	24.649 ²⁶	12.38 ²⁰⁰
31.1	15.631 ³¹	39.35 ¹⁸	38.58 ⁸	44.18 ³¹⁴	21.086 ³¹	68.99 ²¹²	24.623 ⁸	10.38 ²⁰¹
Feb. 10.0	15.662 ⁶¹	39.17 ³⁵	38.50 ¹	41.04 ³²¹	21.117 ⁷⁶	66.87 ²³²	24.631 ⁴¹	8.37 ¹⁹³
20.0	15.723 ⁹⁴	38.82 ⁵⁵	38.49 ⁸	37.83 ³¹²	21.193 ¹²³	64.55 ²⁴³	24.672 ⁷⁹	6.44 ¹⁷⁶
Mar. 2.0	15.817 ¹²³	38.27 ⁷⁴	38.57 ¹⁶	34.71 ²⁹²	21.316 ¹⁶⁹	62.12 ²⁵⁰	24.751 ¹¹⁶	4.68 ¹⁵⁰
11.9	15.940 ¹⁵⁷	37.53 ⁹⁵	38.73 ²⁵	31.79 ²⁶²	21.485 ²¹⁰	59.62 ²⁵³	24.867 ¹⁵⁴	3.18 ¹¹⁸
21.9	16.097 ¹⁸⁸	36.58 ¹¹⁴	38.98 ³²	29.17 ²²¹	21.695 ²⁵⁵	57.09 ²⁵¹	25.021 ¹⁹¹	2.00 ⁸⁰
31.9	16.285 ²¹⁹	35.44 ¹³²	39.30 ³⁸	26.96 ¹⁷¹	21.950 ²⁹⁵	54.58 ²⁴³	25.212 ²²⁶	1.20 ³⁹
Apr. 10.9	16.504 ²⁴⁷	34.12 ¹¹⁶	39.68 ⁴⁵	25.25 ¹¹⁸	22.245 ³³²	52.15 ²³³	25.438 ²⁵⁶	0.81 ⁶
20.8	16.751 ²⁷³	32.66 ¹⁶⁰	40.13 ⁴⁸	24.07 ⁵⁶	22.577 ³⁶²	49.82 ²¹²	25.694 ²⁸²	0.87 ⁵⁰
30.8	17.024 ²⁹²	31.06 ¹⁶⁸	40.61 ⁵²	23.51 ³	22.939 ³⁹⁰	47.70 ¹⁹⁴	25.976 ³⁰²	1.37 ⁹³
May 10.8	17.316 ³⁰⁵	29.38 ¹⁷⁴	41.13 ⁵²	23.54 ⁶⁴	23.329 ⁴⁰⁸	45.76 ¹⁶³	26.278 ³¹⁴	2.30 ¹³⁴
20.8	17.621 ³¹¹	27.64 ¹⁷²	41.65 ⁵³	24.18 ¹²⁰	23.737 ⁴¹⁶	44.13 ¹³³	26.592 ³¹⁹	3.64 ¹⁷¹
30.7	17.932 ³¹¹	25.92 ¹⁶⁷	42.18 ⁵⁰	25.38 ¹⁷⁴	24.153 ⁴¹⁴	42.80 ¹⁰⁰	26.911 ³¹⁵	5.35 ²⁰³
June 9.7	18.243 ³⁰¹	24.25 ¹⁵⁸	42.68 ⁴⁸	27.12 ²²⁴	24.567 ⁴⁰⁴	41.80 ⁶²	27.226 ³⁰¹	7.38 ²²⁷
19.7	18.544 ²⁸⁵	22.67 ¹⁴³	43.16 ⁴⁴	29.36 ²⁶²	24.971 ³⁸¹	41.18 ²⁴	27.527 ²⁸²	9.65 ²⁴⁵
29.6	18.829 ²⁶¹	21.24 ¹²⁶	43.60 ³⁷	31.98 ³⁰¹	25.352 ³⁵²	40.94 ¹⁹	27.809 ²⁵⁴	12.10 ²⁵⁹
July 9.6	19.090 ²²⁸	19.98 ¹⁰³	43.97 ³²	34.99 ³²⁵	25.704 ³⁰⁹	41.13 ⁵⁵	28.063 ²¹⁹	14.69 ²⁶⁵
19.6	19.318 ¹⁹²	18.95 ⁸²	44.29 ²³	38.24 ³⁴⁵	26.013 ²⁶⁰	41.68 ⁹¹	28.282 ¹⁸⁰	17.34 ²⁶⁴
29.6	19.510 ¹⁵¹	18.13 ⁵⁶	44.52 ¹⁷	41.69 ³⁵⁶	26.273 ²⁰⁵	42.59 ¹²⁶	28.462 ¹³⁶	19.98 ²⁵⁶
Aug. 8.5	19.661 ¹⁰⁶	17.57 ³³	44.69 ⁸	45.25 ³⁶⁰	26.478 ¹¹³	43.85 ¹⁵¹	28.598 ⁹¹	22.54 ²⁴⁶
18.5	19.767 ⁶¹	17.24 ¹³	44.77 ⁰	48.85 ³⁵⁵	26.621 ⁸⁰	45.36 ¹⁷⁷	28.689 ⁴⁶	25.00 ²³⁰
28.5	19.828 ¹⁶	17.16 ¹³	44.77 ⁷	52.40 ³⁴⁴	26.701 ¹⁵	47.13 ¹⁹²	28.735 ⁰	27.30 ²⁰⁸
Sept. 7.5	19.844 ²⁵	17.29 ³²	44.70 ¹⁵	55.84 ³²⁵	26.716 ⁴⁵	49.05 ²⁰⁰	28.735 ⁴²	29.38 ¹⁸⁵
17.4	19.819 ⁶⁵	17.61 ⁴⁷	44.55 ²¹	59.09 ²⁹⁸	26.671 ⁹⁹	51.05 ¹⁹⁹	28.693 ⁷⁹	31.23 ¹⁵⁶
27.4	19.754 ⁹⁵	18.08 ⁶⁰	44.34 ²⁸	62.07 ²⁶⁵	26.572 ¹⁴⁸	53.04 ¹⁸⁸	28.614 ¹¹⁰	32.79 ¹²⁷
Oct. 7.4	19.659 ¹¹⁹	18.68 ⁶⁸	44.06 ³²	64.72 ²²⁷	26.424 ¹⁸⁹	54.92 ¹⁷²	28.504 ¹³⁵	34.06 ⁹⁷
17.3	19.540 ¹³⁷	19.36 ⁷³	43.74 ³⁶	66.99 ¹⁸²	26.235 ²¹⁷	56.64 ¹⁵²	28.369 ¹⁵²	35.03 ⁶²
27.3	19.403 ¹¹⁵	20.09 ⁷⁴	43.38 ⁴⁰	68.81 ¹³³	26.018 ²³²	58.16 ¹¹⁷	28.217 ¹⁶⁴	35.65 ²⁸
Nov. 6.3	19.258 ¹⁴⁷	20.83 ⁷²	42.98 ⁴¹	70.14 ⁷⁹	25.786 ²³⁹	59.33 ⁸⁶	28.053 ¹⁶⁷	35.93 ⁸
16.3	19.111 ¹⁴⁰	21.55 ⁶⁷	42.57 ⁴²	70.93 ²¹	25.547 ²²⁸	60.19 ⁴⁵	27.886 ¹⁶²	35.85 ⁴¹
26.2	18.971 ¹²⁹	22.22 ⁶¹	42.15 ⁴¹	71.17 ³⁵	25.319 ²¹⁶	60.64 ³	27.724 ¹⁵⁵	35.44 ⁷⁷
Dec. 6.2	18.842 ¹¹⁰	22.83 ⁵²	41.74 ³⁹	70.82 ⁹³	25.103 ¹⁹³	60.67 ³⁴	27.569 ¹⁴¹	34.67 ¹¹⁰
16.2	18.732 ⁹²	23.35 ⁴³	41.35 ³⁷	69.89 ¹⁴⁹	24.910 ¹⁵⁹	60.33 ⁷²	27.428 ¹²²	33.57 ¹³⁸
26.2	18.640 ⁶⁷	23.78 ³⁴	40.98 ³²	68.40 ¹⁹⁹	24.751 ¹²⁰	59.61 ¹¹³	27.306 ¹⁰⁰	32.19 ¹⁶⁴
36.1	18.573	24.12	40.66	66.41	24.631	58.48	27.206	30.55
Mean Place	16.814	38.06	40.059	34.32	23.225	65.49	25.528	6.33
Sec δ, Tan δ	1.032	-0.254	2.160	+1.914	1.476	-1.085	1.103	+0.466
Dψα, Dωα	+0.064	+0.015	+0.036	-0.111	+0.075	+0.063	+0.055	-0.027
Dψδ, Dωδ	+0.35	-0.49	+0.35	-0.49	+0.35	-0.49	+0.35	-0.49

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Pegasi. Mag. 3.7		π Pegasi. Mag. 4.4		ζ Cephei. Mag. 3.6		24 Cephei. Mag. 5.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 6	° ' " + 5 49	h m 22 6	° ' " +32 47	h m 22 8	° ' " +57 49	h m 22 8	° ' " +71 57
	s	"	s	"	s	"	s	"
Jan. 1.1	18.109 ⁶⁰	11.19 ¹¹¹	33.284 ¹⁰⁵	71.24 ¹⁹³	10.144 ²⁴⁰	34.01 ²²²	18.89 ⁵⁰	61.00 ²¹⁵
11.1	18.049 ³⁷	10.08 ¹¹³	33.179 ⁷⁶	69.31 ²¹⁶	9.904 ¹⁹²	31.79 ²⁵⁹	18.39 ⁴⁰	58.85 ²⁶⁰
21.1	18.012 ¹⁰	8.95 ¹⁰⁹	33.103 ⁴³	67.15 ²³⁰	9.712 ¹³¹	29.20 ²⁸⁹	17.99 ³¹	56.25 ²⁹⁵
31.1	18.002 ¹⁸	7.86 ¹⁰²	33.060 ⁷	64.85 ²²⁸	9.578 ³	26.31 ³¹⁰	17.68 ⁶	53.30 ³²⁹
Feb. 10.0	18.020 ⁵¹	6.84 ⁸⁸	33.053 ³¹	62.52 ²²⁸	9.504 ⁷¹	23.26 ³⁰⁵	17.50 ¹⁸	50.12 ³¹⁸
20.0	18.071 ⁸⁰	5.96 ⁶⁷	33.084 ⁷⁴	60.24 ²¹⁶	9.501 ⁶⁹	20.16 ³⁰²	17.44 ⁷	46.83 ³²⁶
Mar. 2.0	18.151 ¹¹⁴	5.29 ⁴⁴	33.158 ¹¹⁵	58.08 ¹⁸⁸	9.570 ¹⁴¹	17.14 ²⁸⁵	17.51 ²⁰	43.57 ³¹²
12.0	18.265 ¹⁴⁵	4.85 ¹⁶	33.273 ¹⁵⁷	56.20 ¹⁵⁶	9.711 ²¹¹	14.29 ²⁵¹	17.71 ³²	40.45 ²⁸⁴
21.9	18.410 ¹⁷⁹	4.69 ¹³	33.430 ¹⁹⁸	54.64 ¹¹⁷	9.922 ²⁷⁶	11.78 ²¹³	18.03 ⁴⁴	37.61 ²⁴⁶
31.9	18.589 ²⁰⁹	4.82 ⁴⁶	33.628 ²³⁶	53.47 ⁷³	10.198 ³³⁷	9.65 ¹⁶³	18.47 ⁵⁴	35.15 ²⁰⁰
Apr. 10.9	18.798 ²³⁹	5.28 ⁷⁷	33.864 ²⁶⁰	52.74 ²⁵	10.535 ³⁸⁸	8.02 ¹⁰⁹	19.01 ⁶²	33.15 ¹⁴⁴
20.8	19.037 ²⁶⁴	6.05 ¹⁰⁸	34.133 ²⁹⁷	52.49 ²³	10.923 ⁴²⁷	6.93 ⁵³	19.63 ⁶⁹	31.71 ⁸⁷
30.8	19.301 ²⁸²	7.13 ¹³⁵	34.430 ³¹⁶	52.72 ⁷⁴	11.350 ⁴⁵⁵	6.40 ⁹	20.32 ⁷³	30.84 ²⁵
May 10.8	19.583 ²⁹⁷	8.48 ¹⁶⁰	34.746 ³³¹	53.46 ¹¹⁶	11.805 ⁴⁶⁹	6.49 ⁶⁶	21.05 ⁷⁴	30.59 ³⁶
20.8	19.880 ³⁰²	10.08 ¹⁷⁹	35.077 ³³⁵	54.62 ¹⁶³	12.274 ⁴⁷¹	7.15 ¹²⁴	21.79 ⁷⁵	30.95 ⁹⁶
30.7	20.182 ³⁰¹	11.87 ¹⁹⁵	35.412 ³²⁹	56.25 ¹⁹⁹	12.745 ⁴⁵⁸	8.39 ¹⁷⁴	22.54 ⁷¹	31.91 ¹⁵¹
June 9.7	20.483 ²⁹¹	13.82 ²⁰⁰	35.741 ³¹⁷	58.24 ²³¹	13.203 ⁴³⁵	10.13 ²²⁴	23.25 ⁶⁷	33.42 ²⁰¹
19.7	20.774 ²⁷⁴	15.82 ²⁰⁶	36.058 ²⁹⁵	60.55 ²⁵³	13.638 ³⁹⁷	12.37 ²⁶⁰	23.92 ⁶¹	35.46 ²⁴⁸
29.7	21.048 ²⁵⁰	17.88 ²⁰³	36.353 ²⁶⁷	63.08 ²⁷⁵	14.035 ³⁴⁸	14.97 ²⁹⁷	24.53 ⁵²	37.94 ²⁸⁹
July 9.6	21.298 ²²⁰	19.91 ¹⁹⁶	36.620 ²²⁶	65.83 ²⁸⁴	14.383 ²⁹¹	17.94 ³²¹	25.05 ⁴³	40.83 ³¹⁸
19.6	21.518 ¹⁸⁴	21.87 ¹⁸³	36.846 ¹⁸⁶	68.67 ²⁸⁹	14.677 ²³²	21.15 ³³⁹	25.48 ³³	44.01 ³⁴³
29.6	21.702 ¹¹³	23.70 ¹⁶⁸	37.032 ¹⁴¹	71.56 ²⁸⁸	14.909 ¹⁶³	24.54 ³⁵¹	25.81 ²¹	47.44 ³⁶⁰
Aug. 8.5	21.845 ¹⁰¹	25.38 ¹⁵⁰	37.173 ⁹²	74.44 ²⁸³	15.072 ⁹⁴	28.05 ³⁵²	26.02 ¹¹	51.04 ³⁶⁷
18.5	21.946 ⁵⁶	26.88 ¹²⁷	37.265 ⁴¹	77.27 ²⁸⁵	15.166 ²³	31.57 ³⁴⁸	26.13 ¹	54.71 ³⁶⁸
28.5	22.002 ¹⁴	28.15 ¹⁰⁶	37.309 ⁴	79.92 ²⁴⁷	15.189 ⁴⁵	35.05 ³³¹	26.12 ¹²	58.39 ³⁶⁰
Sept. 7.5	22.016 ²⁵	29.21 ⁸⁴	37.305 ⁴⁸	82.39 ²²³	15.144 ¹¹⁰	38.39 ³¹⁶	26.00 ²⁴	61.99 ³⁴³
17.4	21.991 ⁶⁰	30.05 ⁵⁹	37.257 ⁸⁷	84.62 ¹⁹⁵	15.034 ¹⁶⁹	41.55 ²⁹⁰	25.76 ³²	65.42 ³²²
27.4	21.931 ⁹⁰	30.64 ³⁶	37.170 ¹²³	86.57 ¹⁶¹	14.865 ²²¹	44.45 ²⁵⁸	25.44 ⁴²	68.64 ²⁹¹
Oct. 7.4	21.841 ¹¹⁵	31.00 ¹⁶	37.047 ¹⁴⁸	88.18 ¹³²	14.644 ²⁶⁶	47.03 ²²⁰	25.02 ⁵⁰	71.55 ²⁵⁶
17.4	21.726 ¹³¹	31.16 ⁷	36.899 ¹⁶⁸	89.50 ⁹²	14.378 ³⁰²	49.23 ¹⁷⁴	24.52 ⁵⁷	74.11 ²¹²
27.3	21.595 ¹³⁹	31.09 ²⁶	36.731 ¹⁸¹	90.42 ⁵⁴	14.076 ³²⁶	50.97 ¹²⁷	23.95 ⁶¹	76.23 ¹⁶³
Nov. 6.3	21.456 ¹⁴²	30.83 ⁴⁴	36.550 ¹⁸⁷	90.96 ¹²	13.750 ³⁴³	52.24 ⁷⁶	23.34 ⁶⁵	77.86 ¹¹⁰
16.3	21.314 ¹³⁸	30.39 ⁶¹	36.363 ¹⁸⁴	91.08 ²⁸	13.407 ³⁴⁹	53.00 ²²	22.69 ⁶⁷	78.96 ⁵⁰
26.2	21.176 ¹²⁸	29.78 ⁷⁷	36.179 ¹⁷⁹	90.80 ⁷²	13.058 ³⁴³	53.22 ³⁶	22.02 ⁶⁶	79.46 ⁸
Dec. 6.2	21.048 ¹¹³	29.01 ⁸⁸	36.000 ¹⁶⁴	90.08 ¹⁰⁶	12.715 ³²⁹	52.86 ⁹²	21.36 ⁶⁵	79.38 ⁶⁸
16.2	20.935 ⁹⁶	28.13 ¹⁰¹	35.836 ¹⁴⁴	89.02 ¹⁴⁶	12.386 ³⁰³	51.94 ¹⁴⁵	20.71 ⁶⁰	78.70 ¹²⁹
26.2	20.839 ⁷⁴	27.12 ¹⁰⁸	35.692 ¹²¹	87.56 ¹⁸⁰	12.083 ²⁶⁹	50.49 ¹⁹⁵	20.11 ⁵⁵	77.41 ¹⁸⁶
36.1	20.765	26.04	35.571	85.76	11.814	48.54	19.56	75.55
Mean Place	18.965	6.79	33.975	59.55	10.837	16.93	19.825	41.90
Sec δ , Tan δ	1.005	+0.102	1.190	+0.645	1.878	+1.590	3.230	+3.071
$D\psi\alpha$, $D\omega\alpha$	+0.060	-0.006	+0.053	-0.038	+0.041	-0.094	+0.023	-0.181
$D\psi\delta$, $D\omega\delta$	+0.35	-0.48	+0.35	-0.48	+0.35	-0.47	+0.35	-0.47

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	θ Aquarii. Mag. 4.3		α Tucanae. Mag. 2.9		γ Aquarii. Mag. 4.0		31 Pegasi. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 12 s	° ' " - 8 9 "	h m 22 13 s	° ' " -60 38 "	h m 22 17 s	° ' " - 1 46 "	h m 22 17 s	° ' " +11 48 "
Jan. 1.1	45.320	61.76	11.50	48.97	39.900	30.89	42.932	65.78
11.1	45.259	62.27	11.32	47.11	39.835	31.67	42.858	64.49
21.1	45.223	62.71	11.19	44.88	39.794	32.42	42.807	63.14
31.1	45.213	63.03	11.12	42.36	39.776	33.06	42.788	61.78
Feb. 10.0	45.233	63.19	11.13	39.59	39.789	33.61	42.786	60.47
20.0	45.279	63.18	11.19	36.65	39.830	34.02	42.820	59.29
Mar. 2.0	45.362	62.99	11.32	33.60	39.902	34.22	42.887	58.27
12.0	45.473	62.61	11.52	30.52	40.005	34.18	42.986	57.48
21.9	45.617	61.97	11.77	27.47	40.144	33.91	43.121	56.97
31.9	45.792	61.12	12.09	24.51	40.312	33.37	43.291	56.79
Apr. 10.9	45.999	60.02	12.46	21.70	40.515	32.59	43.494	56.95
20.8	46.235	58.73	12.88	19.11	40.746	31.52	43.727	57.46
30.8	46.497	57.26	13.35	16.80	41.001	30.22	43.987	58.33
May 10.8	46.781	55.64	13.85	14.78	41.281	28.71	44.268	59.54
20.8	47.078	53.90	14.38	13.16	41.575	27.03	44.564	61.02
30.7	47.383	52.12	14.92	11.93	41.876	25.23	44.869	62.78
June 9.7	47.688	50.33	15.46	11.13	42.179	23.36	45.172	64.73
19.7	47.987	48.56	15.99	10.80	42.474	21.47	45.469	66.83
29.7	48.269	46.90	16.49	10.93	42.754	19.59	45.750	69.01
July 9.6	48.530	45.37	16.96	11.54	43.012	17.82	46.006	71.23
19.6	48.761	44.03	17.37	12.56	43.243	16.18	46.232	73.42
29.6	48.956	42.86	17.72	14.01	43.438	14.69	46.424	75.52
Aug. 8.5	49.110	41.93	18.00	15.82	43.596	13.38	46.575	77.51
18.5	49.225	41.20	18.19	17.91	43.709	12.31	46.683	79.34
28.5	49.292	40.75	18.30	20.25	43.780	11.45	46.748	80.97
Sept. 7.5	49.319	40.51	18.33	22.72	43.807	10.81	46.771	82.38
17.4	49.302	40.47	18.27	25.23	43.794	10.42	46.753	83.56
27.4	49.250	40.64	18.13	27.69	43.748	10.23	46.700	84.50
Oct. 7.4	49.166	40.95	17.92	29.99	43.666	10.21	46.615	85.18
17.4	49.058	41.42	17.66	32.06	43.565	10.39	46.505	85.62
27.3	48.930	41.97	17.34	33.79	43.442	10.72	46.378	85.81
Nov. 6.3	48.794	42.60	17.00	35.11	43.308	11.19	46.240	85.76
16.3	48.654	43.26	16.65	36.00	43.172	11.76	46.097	85.46
26.2	48.516	43.95	16.30	36.37	43.037	12.41	45.956	84.95
Dec. 6.2	48.390	44.64	15.96	36.23	42.911	13.14	45.822	84.22
16.2	48.277	45.31	15.66	35.59	42.797	13.91	45.700	83.30
26.2	48.182	45.93	15.39	34.44	42.698	14.71	45.594	82.21
36.1	48.110	46.49	15.18	32.85	42.622	15.51	45.506	80.97
Mean Place	46.296	61.93	14.279	37.85	40.779	32.68	43.679	60.01
Sec δ , Tan δ	1.010	-0.143	2.040	-1.778	1.000	-0.031	1.022	+0.209
$D\psi\alpha$, $D\omega\alpha$	+0.063	+0.009	+0.082	+0.106	+0.062	+0.002	+0.059	-0.013
$D\psi\delta$, $D\omega\delta$	+0.36	-0.45	+0.36	-0.45	+0.36	-0.43	+0.36	-0.43

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	3 Lacertæ. Mag. 4.6		π Aquarii. Mag. 4.6		σ Aquarii. Mag. 4.9		α Lacertæ. Mag. 3.8	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 20 s	° ' " +51 50 "	h m 22 21 s	° ' " + 0 59 "	h m 22 26 s	° ' " -11 3 "	h m 22 28 s	° ' " +49 53 "
Jan. 1.2	31.224	50.33	19.840	12.39	33.502	81.95	6.528	25.78
11.1	31.021 ²⁰³	48.26 ²⁰⁷	19.773 ⁶⁷	11.51 ⁸⁸	33.430 ⁷²	82.35 ⁴⁰	6.331 ¹⁹⁷	23.82 ¹⁹⁶
21.1	30.857 ¹⁶⁴	45.80 ²⁴⁶	19.728 ⁴⁵	10.64 ⁸⁷	33.383 ⁴⁷	82.65 ³⁰	6.172 ¹⁵⁹	21.45 ²³⁷
31.1	30.738 ¹¹⁹	43.10 ²⁷⁰	19.706 ²²	9.84 ⁸⁰	33.363 ²⁰	82.78 ¹³	6.054 ¹¹⁸	18.83 ²⁶²
Feb. 10.0	30.673 ⁶⁵	40.21 ²⁸⁹	19.712 ⁶	9.15 ⁶⁹	33.366 ³	82.76 ²	5.985 ⁶⁹	16.03 ²⁸⁰
20.0	30.662 ¹¹	37.28 ²⁹³	19.748 ³⁶	8.61 ⁵¹	33.403 ³⁷	82.57 ¹⁹	5.970 ¹⁵	13.19 ²⁸⁴
Mar. 2.0	30.710 ⁴⁸	34.42 ²⁸⁶	19.815 ⁶⁷	8.22 ³⁹	33.467 ⁶¹	82.20 ³⁷	6.008 ³⁸	10.41 ²⁷⁸
12.0	30.822 ¹¹²	31.73 ²⁰⁹	19.914 ⁹⁹	8.09 ¹³	33.566 ⁹⁹	81.59 ⁶¹	6.108 ¹⁰⁰	7.80 ²⁶¹
21.9	30.993 ¹⁷¹	29.35 ²³⁸	20.047 ¹³³	8.20 ¹¹	33.698 ¹³²	80.78 ⁸¹	6.264 ¹⁵⁶	5.46 ²³⁴
31.9	31.224 ²³¹	27.33 ²⁰²	20.211 ¹⁶¹	8.61 ⁴¹	33.861 ¹⁶³	79.73 ¹⁰⁵	6.478 ²¹⁴	3.47 ¹⁹⁹
Apr. 10.9	31.509 ²⁸⁵	25.79 ¹⁵¹	20.410 ¹⁹⁹	9.27 ⁶⁶	34.060 ¹⁹⁹	78.49 ¹²⁴	6.745 ²⁶⁷	1.96 ¹⁵¹
20.9	31.840 ³³¹	24.76 ¹⁰³	20.639 ²²⁹	10.22 ⁹⁵	34.287 ²²⁷	77.06 ¹⁴³	7.059 ³¹¹	0.91 ¹⁰⁵
30.8	32.209 ³⁶⁹	24.28 ⁴⁸	20.893 ²⁵¹	11.44 ¹²²	34.543 ²⁵⁶	75.48 ¹⁵⁸	7.412 ³⁵³	0.45 ⁴⁶
May 10.8	32.607 ³⁹⁸	24.38 ¹⁰	21.170 ²⁷⁷	12.89 ¹⁴⁵	34.823 ²⁸⁰	73.76 ¹⁷²	7.793 ³⁸¹	0.52 ⁷
20.8	33.023 ⁴¹⁶	25.04 ⁶⁶	21.464 ²⁹¹	14.53 ¹⁶⁴	35.120 ²⁹⁷	71.97 ¹⁷⁹	8.194 ⁴⁰¹	1.17 ⁶⁵
30.7	33.444 ⁴²¹	26.25 ¹²¹	21.764 ³⁰⁰	16.33 ¹⁸⁰	35.424 ³⁰⁴	70.13 ¹⁸⁴	8.602 ⁴⁰⁸	2.32 ¹¹⁵
June 9.7	33.859 ⁴¹⁵	27.95 ¹⁷⁰	22.067 ³⁰³	18.23 ¹⁹⁰	35.734 ³¹⁰	68.33 ¹⁸⁰	9.009 ⁴⁰⁷	4.00 ¹⁶⁸
19.7	34.257 ³⁹⁸	30.11 ²¹⁶	22.361 ²⁹⁴	20.18 ¹⁹⁵	36.039 ³⁰⁵	66.58 ¹⁷⁵	9.398 ³⁸⁹	6.11 ²⁴¹
29.7	34.627 ³⁷⁰	32.63 ²⁵²	22.642 ²⁸¹	22.11 ¹⁹³	36.330 ²⁹¹	64.97 ¹⁶¹	9.765 ³⁶⁷	8.56 ²¹⁵
July 9.6	34.958 ³³¹	35.50 ²⁸⁷	22.901 ²⁵⁹	21.01 ¹⁹⁰	36.500 ²⁷⁰	63.49 ¹¹⁸	10.094 ³²⁹	11.38 ²⁸²
19.6	35.242 ²⁸⁴	38.60 ³¹⁰	23.133 ²³²	25.76 ¹⁷⁵	36.841 ²¹¹	62.23 ¹²⁶	10.382 ²⁸⁸	14.43 ³⁰⁵
29.6	35.473 ²³¹	41.87 ³²⁷	23.329 ¹⁹⁶	27.37 ¹⁶¹	37.050 ²⁰⁹	61.17 ¹⁰⁶	10.618 ²³⁶	17.65 ³²²
Aug. 8.6	35.647 ¹⁷⁴	45.25 ³³⁸	23.489 ¹⁶⁰	28.82 ¹¹⁵	37.218 ¹⁶⁸	60.36 ⁸¹	10.799 ¹⁸¹	20.98 ³³³
18.5	35.760 ¹¹³	48.64 ³³⁹	23.604 ¹¹⁵	30.08 ¹²⁶	37.347 ¹²⁹	59.77 ⁵⁹	10.925 ¹²⁶	24.32 ³³⁴
28.5	35.811 ⁵¹	51.97 ³³³	23.679 ⁷⁵	31.09 ¹⁰¹	37.430 ⁸³	59.46 ³¹	10.992 ⁶⁷	27.60 ³²⁸
Sept. 7.5	35.801 ¹⁰	55.20 ³²³	23.708 ²⁹	31.88 ⁷⁹	37.468 ³⁸	59.39 ⁷	10.997 ⁵	30.79 ³¹⁹
17.4	35.736 ⁶⁵	58.22 ³⁰²	23.699 ⁹	32.47 ⁵⁹	37.466 ²	59.51 ¹²	10.950 ⁴⁷	33.81 ³⁰²
27.4	35.616 ¹²⁰	61.01 ²⁷⁹	23.653 ⁴⁶	32.81 ³¹	37.425 ⁴¹	59.83 ³²	10.850 ¹⁰⁰	36.56 ²⁷⁵
Oct. 7.4	35.451 ¹⁶⁵	63.48 ²¹⁷	23.575 ⁷⁸	32.95 ¹¹	37.352 ⁷³	60.32 ⁴⁹	10.706 ¹¹¹	39.00 ²¹⁴
17.4	35.246 ²⁰⁵	65.59 ²¹¹	23.475 ¹⁰⁰	32.91 ⁴	37.251 ¹⁰¹	60.92 ⁶⁰	10.522 ¹⁸⁴	41.12 ²¹²
27.3	35.009 ²³⁷	67.27 ¹⁶⁸	23.354 ¹²¹	32.68 ²³	37.134 ¹¹⁷	61.61 ⁶⁹	10.307 ²¹⁵	42.80 ¹⁶⁸
Nov. 6.3	34.748 ²⁶¹	68.51 ¹²⁴	23.222 ¹³²	32.30 ³⁸	37.001 ¹³³	62.34 ⁷³	10.067 ²¹⁰	44.08 ¹²⁸
16.3	34.473 ²⁷⁵	69.25 ⁷¹	23.087 ¹³⁵	31.78 ⁵²	36.863 ¹³⁸	63.09 ⁷⁵	9.810 ²⁵⁷	44.85 ⁷⁷
26.3	34.191 ²⁸²	69.49 ²⁴	22.953 ¹³⁴	31.15 ⁶³	36.726 ¹³⁷	63.81 ⁷²	9.548 ²⁶²	45.15 ³⁰
Dec. 6.2	33.911 ²⁸⁰	69.18 ³¹	22.827 ¹²⁶	30.42 ⁷³	36.598 ¹²⁸	64.50 ⁶⁹	9.284 ²⁶¹	44.88 ²⁷
16.2	33.640 ²⁷¹	68.34 ⁸⁴	22.711 ¹¹⁶	29.60 ⁸²	36.481 ¹¹⁷	65.12 ⁶²	9.031 ²⁵³	44.12 ⁷⁶
26.2	33.390 ²⁵⁰	66.99 ¹³⁵	22.608 ¹⁰³	28.73 ⁸⁷	36.380 ¹⁰¹	65.66 ⁵⁴	8.792 ²³⁹	42.82 ¹³⁰
36.1	33.166 ²²¹	65.16 ¹⁸³	22.528 ⁸⁰	27.85 ⁸⁸	36.299 ⁸¹	66.14 ⁴⁸	8.579 ²¹³	41.12 ¹⁷⁰
Mean Place	31.774	34.33	20.673	9.96	34.450	80.64	7.013	10.22
Sec δ, Tan δ	1.619	+1.273	1.000	+0.017	1.019	-0.196	1.552	+1.187
D _{ψα} , D _{ωα}	+0.047	-0.077	+0.061	-0.001	+0.063	+0.012	+0.049	-0.073
D _{ψδ} , D _{ωδ}	+0.36	-0.42	+0.36	-0.42	+0.37	-0.40	+0.37	-0.39

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ν Aquarii. Mag. 5.3		226 B. Cephei. Mag. 5.7		η Aquarii. Mag. 4.1		10 Lacertæ. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 30 s	° ' " -21 5	h m 22 30 s	° ' " +75 49	h m 22 31 s	° ' " - 0 30	h m 22 35 s	° ' " +38 38
Jan. 1.2	27.923	76.15	55.04	66.00	23.205	51.67	47.772	69.46
11.1	27.848	76.14	54.34	64.15	23.130	52.48	47.629	67.67
21.1	27.795	75.92	53.74	61.85	23.078	53.27	47.509	65.56
31.1	27.770	75.51	53.26	59.11	23.047	53.96	47.425	63.25
Feb. 10.1	27.772	74.90	52.92	56.05	23.047	54.56	47.375	60.81
20.0	27.806	74.09	52.74	52.82	23.071	55.00	47.369	58.37
Mar. 2.0	27.871	73.09	52.73	49.54	23.131	55.28	47.404	56.01
12.0	27.969	71.88	52.88	46.34	23.219	55.31	47.486	53.83
21.9	28.103	70.50	53.19	43.35	23.343	55.10	47.618	51.94
31.9	28.271	68.96	53.66	40.67	23.499	54.63	47.795	50.37
Apr. 10.9	28.473	67.27	54.26	38.38	23.689	53.90	48.017	49.26
20.9	28.707	65.46	54.98	36.60	23.911	52.88	48.280	48.59
30.8	28.971	63.59	55.80	35.40	24.161	51.60	48.578	48.42
May 10.8	29.259	61.68	56.68	34.78	24.434	50.12	48.903	48.75
20.8	29.567	59.79	57.60	34.75	24.726	48.44	49.246	49.62
30.8	29.886	57.96	58.52	35.34	25.026	46.64	49.601	50.91
June 9.7	30.209	56.24	59.42	36.50	25.329	44.75	49.956	52.66
19.7	30.528	54.69	60.28	38.21	25.628	42.82	50.300	54.75
29.7	30.834	53.34	61.08	40.40	25.913	40.92	50.625	57.18
July 9.6	31.121	52.23	61.78	43.04	26.179	39.07	50.927	59.87
19.6	31.378	51.38	62.37	46.05	26.417	37.34	51.189	62.74
29.6	31.601	50.82	62.84	49.33	26.622	35.78	51.413	65.72
Aug. 8.6	31.784	50.55	63.18	52.82	26.790	34.39	51.590	68.75
18.5	31.922	50.56	63.39	56.46	26.916	33.21	51.719	71.75
28.5	32.014	50.84	63.46	60.18	27.001	32.25	51.798	74.68
Sept. 7.5	32.061	51.35	63.38	63.87	27.041	31.54	51.825	77.47
17.4	32.063	52.08	63.18	67.50	27.044	31.04	51.808	80.05
27.4	32.024	52.95	62.83	70.92	27.007	30.78	51.745	82.38
Oct. 7.4	31.949	53.93	62.38	74.11	26.940	30.71	51.645	84.44
17.4	31.845	54.97	61.81	76.94	26.846	30.84	51.510	86.15
27.3	31.719	56.01	61.15	79.41	26.732	31.11	51.350	87.51
Nov. 6.3	31.579	57.01	60.41	81.43	26.605	31.54	51.171	88.45
16.3	31.433	57.93	59.61	82.92	26.474	32.09	50.980	88.98
26.3	31.287	58.72	58.77	83.87	26.341	32.73	50.782	89.08
Dec. 6.2	31.148	59.36	57.92	84.18	26.214	33.46	50.585	88.73
16.2	31.022	59.84	57.07	83.88	26.098	34.24	50.394	87.92
26.2	30.913	60.13	56.25	82.97	25.995	35.06	50.218	86.70
36.1	30.824	60.25	55.48	81.49	25.911	35.88	50.059	85.10
Mean Place	29.006	71.84	55.610	46.30	24.002	53.25	48.241	56.60
Sec δ , Tan δ	1.072	-0.386	4.086	+3.962	1.000	-0.009	1.280	+0.800
$D\psi\alpha$, $D\omega\alpha$	+0.065	+0.024	+0.021	-0.244	+0.061	+0.001	+0.054	-0.050
$D\psi\delta$, $D\omega\delta$	+0.37	-0.38	+0.37	-0.38	+0.37	-0.38	+0.37	-0.36

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Piscis Australis. Mag. 4.2		ζ Pegasi. Mag. 3.6		β Gruis. Mag. 2.2		η Pegasi. Mag. 3.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 36 s	° ' " -27 26 "	h m 22 37 s	° ' " +10 25 "	h m 22 38 s	° ' " -47 16 "	h m 22 39 s	° ' " +29 48 "
Jan. 1.2	22.804 ⁸⁸	51.60 ²⁸	36.616 ⁸⁴	48.87 ¹¹⁶	2.849 ¹³⁸	87.50 ¹¹³	22.929 ¹¹⁹	75.16 ¹⁶⁴
11.1	22.716 ⁶²	51.32 ⁵²	36.532 ⁶³	47.71 ¹²⁴	2.711 ¹⁰²	86.37 ¹⁴⁶	22.810 ⁹⁶	73.52 ¹⁸⁷
21.1	22.654 ³⁴	50.80 ⁷⁶	36.469 ⁴²	46.47 ¹²³	2.609 ⁶⁴	84.91 ¹⁸¹	22.714 ⁶⁹	71.65 ²⁰²
31.1	22.620 ⁵	50.04 ⁹⁸	36.427 ¹⁴	45.24 ¹⁰⁶	2.545 ²²	83.10 ²⁰⁷	22.645 ³⁷	69.63 ²⁰⁸
Feb. 10.1	22.615 ²⁷	49.06 ¹²¹	36.413 ¹⁴	44.02 ¹⁰⁶	2.523 ²²	81.03 ²³²	22.608 ¹	67.55 ²⁰⁸
20.0	22.642 ⁶⁰	47.85 ¹³⁹	36.427 ⁴⁹	42.96 ⁹²	2.545 ⁶⁵	78.71 ²⁴⁹	22.607 ³⁶	65.47 ¹⁹⁷
Mar. 2.0	22.702 ⁹⁵	46.46 ¹⁵⁹	36.476 ⁸⁰	42.04 ⁶⁹	2.610 ¹¹⁴	76.22 ²⁶²	22.643 ⁷⁸	63.50 ¹⁷⁶
12.0	22.797 ¹³²	44.87 ¹⁷⁴	36.556 ¹¹⁸	41.35 ⁴²	2.724 ¹⁶⁰	73.60 ²⁶⁹	22.721 ¹¹⁸	61.74 ¹⁵⁰
21.9	22.929 ¹⁶⁸	43.13 ¹⁸⁸	36.674 ¹⁵⁴	40.93 ¹³	2.884 ²⁰⁵	70.91 ²⁷³	22.839 ¹⁶³	60.24 ¹¹⁴
31.9	23.097 ²⁰⁴	41.25 ¹⁹⁸	36.828 ¹⁸⁴	40.80 ²⁰	3.089 ²⁵¹	68.18 ²⁶⁹	23.002 ²⁰²	59.10 ⁷⁶
Apr. 10.9	23.301 ²³⁸	39.27 ²⁰⁵	37.012 ²²¹	41.00 ⁵⁵	3.340 ²⁹³	65.49 ²⁶¹	23.204 ²³⁸	58.34 ³¹
20.9	23.539 ²⁷⁰	37.22 ²⁰⁷	37.233 ²⁴⁶	41.55 ⁸⁶	3.633 ³³²	62.88 ²¹⁷	23.442 ²⁷⁴	58.03 ¹²
30.8	23.809 ²⁹⁶	35.15 ²⁰⁴	37.479 ²⁷⁴	42.41 ¹²⁰	3.965 ³⁶⁴	60.41 ²²⁵	23.716 ²⁹⁹	58.15 ⁶⁰
May 10.8	24.105 ³¹⁶	33.11 ¹⁹⁸	37.753 ²⁹²	43.61 ¹⁴⁸	4.329 ³⁸⁰	58.16 ²⁰⁴	24.015 ³¹⁷	58.75 ¹⁰⁴
20.8	24.421 ³³⁰	31.13 ¹⁸⁵	38.045 ³⁰²	45.09 ¹⁷¹	4.719 ⁴⁰⁷	56.12 ¹⁷⁰	24.332 ³²⁹	59.79 ¹⁴⁴
30.8	24.751 ³³⁶	29.28 ¹⁶⁷	38.347 ⁵⁰⁵	46.80 ¹⁹⁰	5.126 ⁴¹⁵	54.42 ¹³⁷	24.661 ³³¹	61.23 ¹⁸⁰
June 9.7	25.087 ³³³	27.61 ¹⁴⁶	38.652 ³⁰¹	48.70 ²⁰⁶	5.541 ⁴¹²	53.05 ¹⁰⁰	24.992 ³²³	63.03 ²¹¹
19.7	25.420 ³²¹	26.15 ¹¹⁹	38.953 ²⁸⁹	50.76 ²¹⁴	5.953 ³⁹⁸	52.05 ⁵⁸	25.315 ³¹⁰	65.14 ²³⁷
29.7	25.741 ³⁰¹	24.96 ⁹²	39.242 ²⁶⁸	52.90 ²¹⁶	6.351 ³⁷¹	51.47 ¹⁸	25.625 ²⁸⁴	67.51 ²⁵⁵
July 9.6	26.042 ²⁷²	24.04 ⁵⁹	39.510 ²³⁸	55.06 ²¹²	6.725 ³⁴⁰	51.29 ²⁶	25.909 ²⁵⁴	70.06 ²⁶⁸
19.6	26.314 ²³⁸	23.45 ²⁸	39.748 ²⁰⁹	57.18 ²⁰⁶	7.065 ²³⁶	51.55 ⁶⁸	26.163 ²¹⁷	72.74 ²⁷⁴
29.6	26.552 ¹⁹⁶	23.17 ⁴	39.957 ¹⁶⁹	59.24 ¹⁹⁶	7.361 ²⁴⁵	52.23 ¹⁰⁴	26.380 ¹⁷³	75.48 ²⁷¹
Aug. 8.6	26.748 ¹⁵⁰	23.21 ³⁵	40.126 ¹³⁰	61.20 ¹⁷⁶	7.606 ¹⁸⁷	53.27 ¹³⁹	26.553 ¹³¹	78.22 ²⁶⁷
18.5	26.898 ¹⁰²	23.56 ⁶⁴	40.256 ⁸⁵	62.96 ¹⁵⁸	7.793 ¹²⁶	54.66 ¹⁶⁸	26.684 ⁸³	80.89 ²⁵⁸
28.5	27.000 ⁵⁴	24.20 ⁸⁶	40.341 ⁴⁴	64.54 ¹³⁶	7.919 ⁶⁴	56.34 ¹⁹¹	26.767 ⁴⁰	83.47 ²³⁸
Sept. 7.5	27.054 ⁶	25.06 ¹⁰⁷	40.385 ⁴	65.90 ¹¹⁵	7.983 ¹	58.25 ²⁰⁸	26.807 ⁷	85.85 ²¹⁷
17.5	27.060 ³⁷	26.13 ¹²¹	40.389 ³³	67.05 ⁸⁹	7.984 ⁵⁷	60.31 ²¹¹	26.800 ⁴⁶	88.02 ¹⁹⁴
27.4	27.023 ⁷⁵	27.34 ¹²⁹	40.356 ⁶⁴	67.94 ⁶⁵	7.927 ¹⁰⁸	62.42 ²⁰⁹	26.754 ⁸²	89.96 ¹⁶⁶
Oct. 7.4	26.948 ¹⁰⁸	28.63 ¹³¹	40.292 ⁹³	68.59 ⁴³	7.819 ¹⁵²	64.51 ¹⁹⁷	26.672 ¹¹⁰	91.62 ¹³⁴
17.4	26.840 ¹³¹	29.94 ¹²⁷	40.199 ¹¹¹	69.02 ¹⁷	7.667 ¹⁹⁰	66.48 ¹⁷⁹	26.562 ¹³⁶	92.96 ¹⁰⁰
27.3	26.709 ¹⁴⁷	31.21 ¹¹⁶	40.088 ¹²⁷	69.19 ⁶	7.477 ²¹¹	68.27 ¹⁵²	26.426 ¹⁵¹	93.96 ⁶⁶
Nov. 6.3	26.562 ¹⁵⁶	32.37 ¹⁰²	39.961 ¹³⁴	69.13 ²⁴	7.266 ²²⁸	69.79 ¹¹⁸	26.275 ¹⁶²	94.62 ³¹
16.3	26.406 ¹⁵⁶	33.39 ⁸⁴	39.827 ¹³⁷	68.89 ⁴⁹	7.038 ²²³	70.97 ⁸⁰	26.113 ¹⁶⁸	94.93 ⁸
26.3	26.250 ¹⁵¹	34.23 ⁶²	39.690 ¹³²	68.40 ⁶⁷	6.809 ²²⁹	71.77 ³⁹	25.945 ¹⁶⁵	94.85 ⁴⁶
Dec. 6.2	26.099 ¹³⁸	34.85 ³⁹	39.558 ¹²⁴	67.73 ⁸⁶	6.586 ²⁰⁸	72.16 ³	25.780 ¹⁶⁰	94.39 ⁸²
16.2	25.961 ¹²¹	35.24 ¹³	39.434 ¹¹⁰	66.87 ⁹⁹	6.378 ¹⁸⁵	72.13 ⁴⁵	25.620 ¹⁴⁷	93.57 ¹¹⁸
26.2	25.840 ¹⁰¹	35.37 ¹⁰	39.324 ⁹⁶	65.88 ¹¹⁰	6.193 ¹⁵⁶	71.68 ⁸⁷	25.473 ¹²⁹	92.39 ¹⁴⁷
36.2	25.739	35.27	39.228	64.78	6.037	70.81	25.344	90.92
Mean Place	23.977	45.24	37.275	44.14	4.603	76.49	23.424	64.71
Sec δ , Tan δ	1.127	-0.519	1.017	+0.184	1.474	-1.083	1.153	+0.573
$D\psi\alpha$, $D\omega\alpha$	+0.066	+0.032	+0.059	-0.011	+0.071	+0.068	+0.056	-0.036
$D\psi\delta$, $D\omega\delta$	+0.37	-0.36	+0.37	-0.35	+0.37	-0.35	+0.37	-0.34

APPARENT PLACES OF STARS, 1923. 501

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	λ Pegasi. Mag. 4.1		ϵ Gruis. Mag. 3.7		τ Aquarii. Mag. 4.2		μ Pegasi. Mag. 3.7	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 42	° ' +23 9	h m 22 43	° ' -51 42	h m 22 45	° ' -13 59	h m 22 46	° ' +24 11
	s	"	s	"	s	"	s	"
Jan. 1.2	48.685	44.64	52.726	91.71	30.137	60.77	16.622	49.33
11.1	48.577	43.16	52.560	90.46	30.053	61.06	16.512	47.86
21.1	48.495	41.51	52.434	88.82	29.992	61.22	16.423	46.19
31.1	48.434	39.76	52.350	86.82	29.953	61.20	16.359	44.42
Feb. 10.1	48.402	37.97	52.310	84.54	29.941	61.00	16.324	42.60
20.0	48.403	36.21	52.319	82.02	29.957	60.62	16.320	40.81
Mar. 2.0	48.441	34.59	52.379	79.31	30.002	60.03	16.352	39.15
12.0	48.514	33.18	52.488	76.48	30.081	59.23	16.422	37.67
21.9	48.629	32.05	52.650	73.58	30.194	58.22	16.532	36.46
31.9	48.780	31.21	52.860	70.67	30.341	56.99	16.682	35.58
Apr. 10.9	48.971	30.78	53.122	67.82	30.523	55.58	16.870	35.07
20.9	49.199	30.73	53.430	65.08	30.739	53.99	17.096	34.96
30.8	49.456	31.12	53.781	62.51	30.985	52.27	17.354	35.28
May 10.8	49.741	31.90	54.168	60.17	31.257	50.44	17.639	36.02
20.8	50.046	33.07	54.584	58.10	31.549	48.55	17.944	37.15
30.8	50.360	34.59	55.018	56.37	31.856	46.65	18.261	38.64
June 9.7	50.679	36.44	55.463	55.02	32.169	44.79	18.583	40.45
19.7	50.994	38.51	55.905	54.08	32.480	43.03	18.899	42.53
29.7	51.293	40.81	56.336	53.57	32.780	41.41	19.201	44.82
July 9.6	51.569	43.25	56.740	53.51	33.063	39.97	19.483	47.25
19.6	51.822	45.76	57.110	53.89	33.320	38.75	19.736	49.78
29.6	52.035	48.28	57.435	54.71	33.545	37.77	19.954	52.33
Aug. 8.6	52.211	50.76	57.705	55.93	33.734	37.07	20.133	54.84
18.5	52.342	53.18	57.912	57.51	33.880	36.62	20.269	57.27
28.5	52.432	55.42	58.051	59.37	33.983	36.45	20.362	59.57
Sept. 7.5	52.475	57.49	58.128	61.47	34.041	36.52	20.410	61.69
17.5	52.479	59.34	58.134	63.72	34.057	36.84	20.416	63.60
27.4	52.444	60.93	58.078	66.01	34.034	37.34	20.383	65.26
Oct. 7.4	52.375	62.27	57.961	68.28	33.976	38.00	20.316	66.66
17.4	52.277	63.32	57.796	70.41	33.890	38.76	20.220	67.76
27.3	52.155	64.06	57.590	72.32	33.781	39.59	20.100	68.56
Nov. 6.3	52.020	64.50	57.354	73.95	33.656	40.45	19.965	69.06
16.3	51.872	64.61	57.101	75.20	33.523	41.30	19.819	69.23
26.3	51.721	64.41	56.842	76.02	33.388	42.10	19.668	69.07
Dec. 6.2	51.571	63.89	56.589	76.41	33.257	42.83	19.518	68.59
16.2	51.428	63.06	56.351	76.33	33.135	43.47	19.373	67.79
26.2	51.297	61.94	56.136	75.79	33.025	43.99	19.238	66.70
36.2	51.179	60.59	55.952	74.81	32.932	44.39	19.118	65.34
Mean Place	49.207	36.21	54.648	79.45	31.029	57.67	17.111	40.66
Sec δ , Tan δ	1.088	+0.428	1.614	-1.267	1.031	-0.249	1.096	+0.449
$D\psi\alpha$, $D\omega\alpha$	+0.057	-0.027	+0.072	+0.080	+0.063	+0.016	+0.057	-0.028
$D\psi\delta$, $D\omega\delta$	+0.38	-0.33	+0.38	-0.33	+0.38	-0.32	+0.38	-0.32

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ι Cephei. Mag. 3.7		λ Aquarii. Mag. 3.8		ρ Indi. Mag. 6.1		δ Aquarii. Mag. 3.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 46 s	° ' " +65 47 "	h m 22 48 s	° ' " - 7 59 "	h m 22 49 s	° ' " -70 28 "	h m 22 50 s	° ' " -16 13 "
Jan. 1.2	55.86 40	60.87 176	35.099 83	24.50 52	15.48 40	83.22 191	33.019 87	54.54 23
11.1	55.46 34	59.11 222	35.016 64	25.02 42	15.08 32	81.31 237	32.932 67	54.77 4
21.1	55.12 28	56.89 262	34.952 42	25.44 30	14.76 23	78.94 274	32.865 43	54.81 12
31.1	54.84 20	54.27 294	34.910 18	25.74 16	14.53 14	76.20 305	32.822 19	54.69 33
Feb. 10.1	54.64 11	51.33 310	34.892 12	25.90 4	14.39 5	73.15 328	32.803 10	54.36 53
20.0	54.53 2	48.23 313	34.904 41	25.86 22	14.34 6	69.87 342	32.813 42	53.83 72
Mar. 2.0	54.51 7	45.10 308	34.945 75	25.64 45	14.40 14	66.45 351	32.855 74	53.11 96
12.0	54.58 18	42.02 289	35.020 109	25.19 66	14.54 25	62.94 348	32.929 110	52.15 114
22.0	54.76 26	39.13 257	35.129 143	24.53 90	14.79 34	59.46 342	33.039 144	51.01 135
31.9	55.02 36	36.56 218	35.272 177	23.63 113	15.13 42	56.04 325	33.183 178	49.66 153
Apr. 10.9	55.38 43	34.38 167	35.449 210	22.50 134	15.55 51	52.79 301	33.361 211	48.13 169
20.9	55.81 49	32.71 115	35.659 241	21.16 152	16.06 58	49.78 271	33.575 245	46.44 183
30.8	56.30 54	31.56 58	35.900 267	19.64 170	16.64 61	47.04 237	33.820 272	44.61 189
May 10.8	56.84 58	30.98 1	36.167 288	17.94 181	17.28 70	44.67 199	34.092 294	42.72 195
20.8	57.42 59	30.99 59	36.455 301	16.13 190	17.98 72	42.68 153	34.386 308	40.77 193
30.8	58.01 59	31.58 117	36.756 307	14.23 189	18.70 74	41.15 104	34.694 314	38.84 186
June 9.7	58.60 56	32.75 172	37.063 305	12.34 187	19.44 75	40.11 53	35.008 315	36.98 175
19.7	59.16 54	34.47 217	37.368 295	10.47 176	20.19 72	39.58 1	35.323 305	35.23 159
29.7	59.70 49	36.64 261	37.663 278	8.71 164	20.91 68	39.57 51	35.628 288	33.64 139
July 9.7	60.19 42	39.25 295	37.941 254	7.07 149	21.59 63	40.08 102	35.916 263	32.25 114
19.6	60.61 35	42.20 320	38.195 222	5.58 125	22.22 55	41.10 149	36.179 231	31.11 89
29.6	60.96 28	45.40 315	38.417 184	4.33 105	22.77 45	42.59 191	36.410 193	30.22 61
Aug. 8.6	61.24 19	48.85 357	38.601 148	3.28 78	23.22 35	44.50 229	36.603 153	29.61 34
18.5	61.43 11	52.42 363	38.749 102	2.50 54	23.57 21	46.79 258	36.756 107	29.27 5
28.5	61.54 2	56.05 360	38.851 62	1.96 32	23.81 11	49.37 275	36.863 66	29.22 21
Sept. 7.5	61.56 6	59.65 350	38.913 18	1.64 4	23.92 1	52.12 286	36.929 23	29.43 43
17.5	61.50 14	63.15 333	38.931 20	1.60 16	23.91 13	54.98 285	36.952 20	29.86 63
27.4	61.36 22	66.48 307	38.911 53	1.76 31	23.78 24	57.83 273	36.932 53	30.49 77
Oct. 7.4	61.14 28	69.55 277	38.858 83	2.07 49	23.54 34	60.56 218	36.879 85	31.26 89
17.4	60.86 34	72.32 239	38.775 100	2.56 60	23.20 42	63.04 216	36.794 106	32.15 93
27.4	60.52 38	74.71 195	38.675 119	3.16 68	22.78 49	65.20 173	36.688 124	33.08 95
Nov. 6.3	60.14 43	76.66 144	38.556 129	3.84 73	22.29 53	66.93 124	36.564 134	34.03 99
16.3	59.71 45	78.10 90	38.427 131	4.57 75	21.76 56	68.17 68	36.430 135	34.93 85
26.3	59.26 46	79.00 31	38.296 126	5.32 72	21.20 55	68.85 11	36.295 134	35.78 74
Dec. 6.2	58.80 16	79.31 26	38.170 120	6.04 70	20.65 53	68.96 47	36.161 126	36.52 63
16.2	58.34 45	79.05 86	38.050 109	6.74 66	20.12 48	68.49 106	36.035 113	37.15 48
26.2	57.89 42	78.19 143	37.941 94	7.40 60	19.64 44	67.43 159	35.922 97	37.63 34
36.2	57.47	76.76	37.847	8.00	19.20	65.84	35.825	37.97
Mean Place	56.084	42.42	35.896	23.03	19.200	68.14	33.921	50.49
Sec δ , Tan δ	2.439	+2.225	1.010	-0.140	2.993	-2.821	1.042	-0.291
$D\psi\alpha$, $D\omega\alpha$	+0.043	-0.141	+0.062	+0.009	+0.084	+0.179	+0.063	+0.019
$D\psi\delta$, $D\omega\delta$	+0.38	-0.31	+0.38	-0.31	+0.38	-0.30	+0.38	-0.30

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	α Piscis Australis. (Fomalhaut.) Mag. 1.3		α Andromedæ. Mag. 3.6		β Pegasi. Var. 2.2-2.7		α Pegasi. (Markab.) Mag. 2.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 22 53	° ' -30 1	h m 22 58	° ' +41 54	h m 23 0	° ' +27 39	h m 23 0	° ' +14 47
	s	"	s	"	s	"	s	"
Jan. 1.2	22.833	58.92	22.172	55.95	1.963	62.58	54.937	31.79
11.1	22.729	58.61	22.001	54.32	1.839	61.13	54.832	30.58
21.1	22.647	58.03	21.854	52.34	1.735	59.46	54.748	29.28
31.1	22.594	57.17	21.735	50.09	1.652	57.63	54.685	27.93
Feb. 10.1	22.569	56.08	21.651	47.69	1.599	55.73	54.644	26.60
20.0	22.574	54.73	21.611	45.20	1.579	53.82	54.635	25.34
Mar. 2.0	22.617	53.15	21.616	42.75	1.593	52.00	54.654	24.21
12.0	22.694	51.39	21.670	40.44	1.649	50.35	54.711	23.25
22.0	22.810	49.46	21.776	38.34	1.746	48.95	54.806	22.56
31.9	22.962	47.41	21.933	36.58	1.883	47.85	54.938	22.18
Apr. 10.9	23.155	45.25	22.139	35.18	2.064	47.14	55.105	22.11
20.9	23.383	43.03	22.392	34.26	2.285	46.82	55.310	22.40
30.8	23.647	40.79	22.686	33.78	2.539	46.94	55.550	23.06
May 10.8	23.938	38.61	23.011	33.84	2.825	47.48	55.814	24.03
20.8	24.254	36.51	23.362	34.41	3.132	48.45	56.103	25.33
30.8	24.589	34.54	23.728	35.46	3.454	49.79	56.405	26.93
June 9.7	24.928	32.79	24.098	36.96	3.783	51.49	56.715	28.77
19.7	25.270	31.26	24.465	38.86	4.108	53.50	57.025	30.76
29.7	25.601	30.05	24.813	41.13	4.424	55.76	57.323	32.91
July 9.7	25.917	29.10	25.141	43.70	4.718	58.21	57.604	35.14
19.6	26.209	28.53	25.432	46.48	4.986	60.76	57.860	37.39
29.6	26.465	28.27	25.686	49.44	5.218	63.38	58.086	39.60
Aug. 8.6	26.680	28.39	25.894	52.49	5.414	66.02	58.276	41.75
18.5	26.851	28.81	26.054	55.56	5.565	68.60	58.427	43.75
28.5	26.974	29.56	26.164	58.63	5.673	71.07	58.534	45.58
Sept. 7.5	27.048	30.55	26.220	61.54	5.736	73.37	58.602	47.20
17.5	27.073	31.78	26.229	64.30	5.757	75.49	58.627	48.62
27.4	27.056	33.15	26.194	66.88	5.737	77.37	58.617	49.79
Oct. 7.4	26.997	34.61	26.114	69.19	5.682	78.99	58.571	50.74
17.4	26.900	36.10	25.998	71.18	5.595	80.33	58.498	51.43
27.4	26.777	37.54	25.851	72.82	5.482	81.35	58.400	51.82
Nov. 6.3	26.633	38.87	25.679	74.06	5.350	82.05	58.285	52.02
16.3	26.483	40.04	25.488	74.90	5.204	82.43	58.159	51.95
26.3	26.323	41.01	25.288	75.27	5.052	82.43	58.026	51.64
Dec. 6.2	26.165	41.71	25.082	75.20	4.896	82.11	57.892	51.10
16.2	26.017	42.17	24.877	74.69	4.743	81.42	57.763	50.33
26.2	25.884	42.32	24.681	73.69	4.597	80.42	57.639	49.39
36.2	25.770	42.22	24.499	72.30	4.464	79.13	57.530	48.28
Mean Place	23.969	50.80	22.449	42.57	2.343	53.20	55.423	26.45
Sec δ , Tan δ	1.155	-0.578	1.344	+0.898	1.129	+0.525	1.034	+0.264
$D\psi\alpha$, $D\omega\alpha$	+0.066	+0.037	+0.055	-0.058	+0.058	-0.034	+0.059	-0.017
$D\psi\delta$, $D\omega\delta$	+0.38	-0.29	+0.38	-0.27	+0.38	-0.26	+0.38	-0.26

APPARENT PLACES OF STARS, 1923.

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	55 Pegasi. Mag. 4.7		c ² Aquarii. Mag. 3.8		π Cephei. Mag. 4.6		ι Gruis. Mag. 4.1	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 3	° ' " + 8 59	h m 23 5	° ' " -21 35	h m 23 5	° ' " +74 58	h m 23 5	° ' " -45 39
	s	"	s	"	s	"	s	"
Jan. 1.2	6.939	38.86	19.678	33.00	26.88	35.31	58.859	63.60
11.2	6.841 ⁹⁸	37.81 ¹⁰⁵	19.577 ¹⁰¹	33.06 ⁶	26.17 ⁷¹	33.91 ¹¹⁰	58.700 ¹⁵⁹	62.76 ⁸⁴
21.1	6.761 ⁸⁰	36.72 ¹⁰⁹	19.496 ⁸¹	32.90 ¹⁶	25.54 ⁶³	31.96 ¹⁹⁵	58.572 ¹²⁸	61.54 ¹²²
31.1	6.702 ⁵⁹	35.62 ¹¹⁰	19.438 ⁵⁸	32.50 ⁴⁰	25.00 ⁵⁴	29.54 ²⁴²	58.474 ⁹⁸	59.93 ¹⁶¹
Feb. 10.1	6.664 ³⁸	34.58 ¹⁰⁴	19.403 ³⁵	31.87 ⁶³	24.57 ⁴³	26.74 ²⁸⁰	58.415 ⁵⁹	58.03 ¹⁹⁰
20.0	6.655 ⁹	33.62 ⁹⁶	19.398 ⁵	31.03 ⁸⁴	24.29 ²⁸	23.68 ³⁰⁶	58.395 ²⁰	55.83 ²²⁰
Mar. 2.0	6.676 ²¹	32.82 ⁸⁰	19.423 ²⁵	29.96 ¹⁰⁷	24.15 ¹⁴	20.48 ³²⁰	58.418 ²³	53.42 ²⁴¹
12.0	6.731 ⁵⁵	32.23 ⁵⁹	19.483 ⁶⁰	28.67 ¹²⁹	24.17 ²	17.27 ³²¹	58.485 ⁶⁷	50.82 ²⁶⁰
22.0	6.822 ⁹¹	31.87 ³⁶	19.580 ⁹⁷	27.19 ¹⁴⁸	24.35 ¹⁸	14.17 ³¹⁰	58.599 ¹¹⁴	48.11 ²⁷¹
31.9	6.949 ¹²⁷	31.82 ⁵	19.711 ¹³¹	25.51 ¹⁶⁸	24.68 ³³	11.31 ²⁸⁶	58.761 ¹⁶²	45.31 ²⁸⁰
Apr. 10.9	7.113 ¹⁶⁴	32.06 ²¹	19.880 ¹⁶⁹	23.69 ¹⁸²	25.16 ⁴⁸	8.79 ²⁵²	58.968 ²⁰⁷	42.51 ²⁸⁰
20.9	7.313 ²⁰⁰	32.62 ⁵⁶	20.085 ²⁰⁵	21.73 ¹⁹⁶	25.76 ⁶⁰	6.71 ²⁰⁸	59.221 ²⁵³	39.75 ²⁷⁶
30.9	7.545 ²³²	33.50 ⁸⁸	20.325 ²¹⁰	19.70 ²⁰³	26.16 ⁷⁰	5.13 ¹⁵⁸	59.515 ²⁹⁴	37.09 ²⁶⁶
May 10.8	7.806 ²⁶¹	34.68 ¹¹⁸	20.594 ²⁶⁹	17.61 ²⁰⁹	27.26 ⁸⁰	4.10 ¹⁰³	59.848 ³³³	34.58 ²⁵¹
20.8	8.089 ²⁸³	36.13 ¹¹⁵	20.889 ²⁹⁵	15.53 ²⁰⁸	28.10 ⁸¹	3.66 ⁴¹	60.210 ³⁶²	32.30 ²²⁸
30.8	8.387 ²⁹⁸	37.82 ¹⁶⁹	21.200 ³¹¹	13.49 ²⁰⁴	28.99 ⁸⁹	3.83 ¹⁷	60.596 ³⁸⁶	30.28 ²⁰²
June 9.7	8.632 ³⁰⁵	39.70 ¹⁸⁸	21.522 ³²²	11.59 ¹⁹⁰	29.87 ⁸⁸	4.57 ⁷⁴	60.996 ⁴⁰⁰	28.60 ¹⁶⁸
19.7	8.998 ³⁰⁶	41.70 ²⁰⁰	21.845 ³²³	9.84 ¹⁷⁵	30.73 ⁸⁶	5.88 ¹³¹	61.399 ⁴⁰³	27.27 ¹³³
29.7	9.295 ²⁹⁷	43.79 ²⁰⁹	22.164 ³¹⁹	8.31 ¹⁵³	31.55 ⁸²	7.71 ¹⁸³	61.794 ³⁹⁵	26.36 ⁹¹
July 9.7	9.576 ²⁸¹	45.90 ²¹¹	22.165 ³⁰¹	7.01 ¹³⁰	32.30 ⁷⁵	10.01 ²³⁰	62.173 ³⁷⁹	25.86 ⁵⁰
19.6	9.832 ²⁵⁶	47.98 ²⁰⁸	22.743 ²⁷⁸	6.01 ¹⁰⁰	32.97 ⁶⁷	12.71 ²⁷⁰	62.524 ³⁵¹	25.80 ⁶
29.6	10.058 ²²⁶	49.99 ²⁰¹	22.993 ²⁵⁰	5.31 ⁷⁰	33.53 ⁵⁶	15.77 ³⁰⁶	62.838 ³¹⁴	26.16 ³⁶
Aug. 8.6	10.250 ¹⁹²	51.87 ¹⁸⁸	23.205 ²¹²	4.92 ³⁹	33.99 ⁴⁶	19.11 ³³⁴	63.106 ²⁶⁸	26.96 ⁸⁰
18.6	10.402 ¹⁵²	53.58 ¹⁷¹	23.375 ¹⁷⁰	4.83 ⁹	34.32 ³³	22.65 ³⁵⁴	63.323 ²¹⁷	28.13 ¹¹⁷
28.5	10.513 ¹¹¹	55.10 ¹⁵²	23.502 ¹²⁷	5.05 ²²	34.53 ²¹	26.33 ³⁶⁸	63.181 ¹⁵⁸	29.65 ¹⁵²
Sept. 7.5	10.583 ⁷⁰	56.41 ¹³¹	23.581 ⁸²	5.55 ⁵⁰	34.60 ⁷	30.04 ³⁷¹	63.580 ⁹⁹	31.43 ¹⁷⁸
17.5	10.613 ³⁰	57.48 ¹⁰⁷	23.623 ³⁹	6.30 ⁷⁵	34.55 ⁵	33.72 ³⁶⁸	63.622 ⁴²	33.43 ²⁰⁰
27.4	10.601 ⁹	58.34 ⁸⁶	23.617 ⁶	7.22 ⁹²	34.37 ¹⁸	37.31 ³⁵⁹	63.604 ¹⁸	35.54 ²¹¹
Oct. 7.4	10.563 ⁴¹	58.94 ⁶⁰	23.574 ¹³	8.30 ¹⁰⁸	34.08 ²⁹	40.70 ³³⁹	63.532 ⁷²	37.70 ²¹⁶
17.4	10.492 ⁷¹	59.32 ³⁸	23.498 ⁷⁶	9.46 ¹¹⁶	33.67 ⁴¹	43.84 ³¹¹	63.416 ¹¹⁶	39.80 ²¹⁰
27.4	10.402 ⁹⁰	59.49 ¹⁷	23.397 ¹⁰¹	10.65 ¹¹⁹	33.16 ⁵¹	46.63 ²⁷⁹	63.262 ¹⁵⁴	41.77 ¹⁹⁷
Nov. 6.3	10.292 ¹¹⁰	59.43 ⁶	23.275 ¹²²	11.82 ¹¹⁷	32.56 ⁶⁰	49.03 ²¹⁰	63.076 ¹⁸⁶	43.51 ¹⁷⁴
16.3	10.171 ¹²¹	59.18 ²⁵	23.144 ¹³¹	12.90 ¹⁰⁸	31.89 ⁶⁷	50.96 ¹⁹³	62.871 ²⁰⁵	44.95 ¹⁴⁴
26.3	10.044 ¹²⁷	58.74 ⁴⁴	23.003 ¹⁴¹	13.87 ⁹⁷	31.16 ⁷³	52.34 ¹³⁸	62.659 ²¹²	46.05 ¹¹⁰
Dec. 6.3	9.916 ¹²⁸	58.14 ⁶⁰	22.865 ¹³⁸	14.67 ⁸⁰	30.39 ⁷⁷	53.15 ⁸¹	62.444 ²¹⁵	46.73 ⁶⁸
16.2	9.793 ¹²³	57.37 ⁷⁷	22.731 ¹³⁴	15.30 ⁶³	29.61 ⁷⁸	53.36 ²¹	62.235 ²⁰⁹	47.01 ²⁸
26.2	9.677 ¹¹⁶	56.48 ⁸⁹	22.608 ¹²³	15.73 ⁴³	28.83 ⁷⁸	52.93 ⁴³	62.044 ¹⁹¹	46.87 ¹⁴
36.2	9.572 ¹⁰⁵	55.48 ¹⁰⁰	22.498 ¹¹⁰	15.92 ¹⁹	28.08 ⁷⁵	51.90 ¹⁰³	61.873 ¹⁷¹	46.28 ⁵⁹
Mean Place	7.469	35.46	20.584	26.55	26.638	15.74	60.354	50.95
Sec δ, Tan δ	1.012	+0.158	1.075	-0.395	3.858	+3.726	1.431	-1.023
Dψα, Dωα	+0.060	-0.010	+0.064	+0.026	+0.038	-0.241	+0.068	+0.066
Dψδ, Dωδ	+0.39	-0.25	+0.39	-0.24	+0.39	-0.24	+0.39	-0.23

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	59 Pegasi. Mag. 5.2		5 H ¹ . Cassiopeiae. Mag. 5.6		φ Aquarii. Mag. 4.4		ψ Aquarii. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 7 s	° ' " + 8 18 "	h m 23 9 s	° ' " +56 44 "	h m 23 10 s	° ' " - 6 27 "	h m 23 11 s	° ' " - 9 30 "
Jan. 1.2	50.379	9.35	34.148	51.80	19.431	53.78	50.843	29.45
11.2	50.279	8.33	33.874	50.27	19.335	54.37	50.746	29.94
21.1	50.196	7.28	33.630	48.29	19.255	54.86	50.667	30.31
31.1	50.133	6.23	33.426	45.92	19.197	55.23	50.609	30.53
Feb. 10.1	50.091	5.24	33.272	43.28	19.158	55.47	50.571	30.58
20.0	50.078	4.32	33.176	40.44	19.149	55.51	50.560	30.45
Mar. 2.0	50.095	3.56	33.144	37.55	19.167	55.38	50.577	30.11
12.0	50.145	3.02	33.183	34.71	19.219	55.00	50.628	29.56
22.0	50.232	2.71	33.234	32.03	19.303	54.42	50.713	28.78
31.9	50.354	2.69	33.478	29.65	19.424	53.58	50.833	27.77
Apr. 10.9	50.514	2.96	33.730	27.61	19.580	52.51	50.990	26.52
20.9	50.709	3.55	34.046	26.03	19.774	51.21	51.183	25.10
30.9	50.938	4.46	34.416	24.96	20.001	49.70	51.410	23.47
May 10.8	51.196	5.65	34.831	24.41	20.254	48.06	51.665	21.69
20.8	51.477	7.11	35.281	24.43	20.534	46.26	51.946	19.80
30.8	51.774	8.80	35.750	25.01	20.829	44.35	52.243	17.86
June 9.7	52.079	10.67	36.227	26.13	21.134	42.42	52.550	15.91
19.7	52.385	12.65	36.697	27.74	21.441	40.48	52.861	14.00
29.7	52.683	14.74	37.148	29.79	21.741	38.63	53.164	12.18
July 9.7	52.965	16.82	37.569	32.26	22.027	36.90	53.454	10.52
19.6	53.224	18.89	37.950	35.07	22.291	35.33	53.722	9.03
29.6	53.453	20.89	38.280	38.13	22.528	33.93	53.962	7.78
Aug. 8.6	53.650	22.73	38.553	41.41	22.728	32.77	54.168	6.76
18.6	53.806	24.41	38.766	44.79	22.891	31.87	54.334	6.01
28.5	53.922	25.91	38.914	48.24	23.016	31.20	54.462	5.52
Sept. 7.5	53.996	27.18	38.996	51.66	23.097	30.83	54.547	5.30
17.5	54.032	28.22	39.015	54.99	23.139	30.66	54.589	5.32
27.4	54.028	29.04	38.973	58.16	23.139	30.70	54.593	5.56
Oct. 7.4	53.993	29.61	38.875	61.10	23.108	30.98	54.562	6.00
17.4	53.927	29.96	38.724	63.76	23.043	31.42	54.500	6.59
27.4	53.839	30.10	38.529	66.07	22.959	31.99	54.415	7.29
Nov. 6.3	53.733	30.01	38.294	67.96	22.853	32.64	54.311	8.06
16.3	53.615	29.75	38.031	69.41	22.736	33.38	54.193	8.88
26.3	53.489	29.31	37.742	70.35	22.615	34.13	54.070	9.69
Dec. 6.3	53.363	28.70	37.441	70.76	22.490	34.89	53.945	10.49
16.2	53.239	27.94	37.132	70.63	22.368	35.65	53.823	11.22
26.2	53.123	27.06	36.830	69.95	22.256	36.37	53.709	11.87
36.2	53.017	26.10	36.542	68.72	22.152	37.01	53.605	12.43
Mean Place	50.888	6.35	34.180	35.13	20.091	51.79	51.534	26.41
Sec δ, Tan δ	1.011	+0.146	1.824	+1.525	1.006	-0.113	1.014	-0.167
Dψa, Dωa	+0.060	-0.009	+0.052	-0.099	+0.062	+0.007	+0.062	+0.011
Dψδ, Dωδ	+0.39	-0.23	+0.39	-0.22	+0.39	-0.22	+0.39	-0.21

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Tucanæ. Mag. 4.1		γ Piscum. Mag. 3.8		γ Sculptoris. Mag. 4.5		α Cephei. Mag. 4.9	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 12 s	° ' -58 39 "	h m 23 13 s	° ' + 2 51 "	h m 23 14 s	° ' -32 56 "	h m 23 15 s	° ' +67 41 "
Jan. 1.2	54.561	46.16	9.852	41.81	39.073	76.54	27.62	42.69
11.2	54.311 ²⁵⁰	44.90 ¹²⁶	9.755 ⁹⁷	40.95 ⁸⁸	38.949 ¹²⁴	76.23 ³¹	27.16 ⁴⁶	41.30 ¹³⁹
21.1	54.100 ²¹¹	43.18 ¹⁷²	9.674 ⁸¹	40.11 ⁸⁴	38.844 ¹⁰⁵	75.60 ⁶³	26.75 ⁴¹	39.43 ¹⁸⁷
31.1	53.935 ¹⁶⁵	41.04 ²¹⁴	9.612 ⁶²	39.31 ⁸⁰	38.766 ⁷⁸	74.66 ⁹⁴	26.39 ³⁶	37.06 ²³⁷
Feb. 10.1	53.822 ¹¹³	38.57 ²⁴⁷	9.571 ⁴¹	38.61 ⁷⁰	38.714 ⁵²	73.44 ¹²²	26.11 ²⁸	34.37 ²⁶⁹
20.1	53.764 ⁵⁸	35.78 ²⁷⁹	9.557 ¹⁴	38.02 ⁵⁹	38.695 ¹⁹	71.96 ¹⁴⁸	25.91 ²⁰	31.40 ²⁹⁷
Mar. 2.0	53.764 ⁰	32.78 ³⁰⁰	9.571 ¹⁴	37.60 ⁴²	38.708 ¹³	70.23 ¹⁷³	25.82 ⁹	28.30 ³¹⁰
12.0	53.825 ⁶¹	29.63 ³¹⁵	9.617 ⁴⁶	37.39 ²¹	38.759 ⁵¹	68.28 ¹⁹⁵	25.82 ⁰	25.21 ³⁰⁹
22.0	53.947 ¹²²	26.39 ³²⁴	9.699 ⁸²	37.41 ²	38.849 ⁹⁰	66.16 ²¹²	25.94 ¹²	22.23 ²⁹⁸
31.9	54.135 ¹⁸⁸	23.13 ³²⁶	9.818 ¹¹⁹	37.70 ²⁹	38.979 ¹³⁰	63.89 ²²⁷	26.16 ²²	19.47 ²⁷⁶
Apr. 10.9	54.381 ²¹⁶	19.91 ³²²	9.974 ¹⁵⁶	38.27 ⁵⁷	39.150 ¹⁷¹	61.53 ²³⁶	26.43 ³²	17.07 ²⁴⁰
20.9	54.689 ³⁰⁸	16.83 ³⁰⁸	10.164 ¹⁹⁰	39.12 ⁸⁵	39.362 ²¹²	59.11 ²¹²	26.89 ⁴¹	15.09 ¹⁹⁸
30.9	55.050 ³⁶¹	13.92 ²⁹¹	10.389 ²²⁵	40.24 ¹¹²	39.610 ²¹⁸	56.68 ²¹³	27.38 ⁴⁹	13.61 ¹⁴⁸
May 10.8	55.460 ⁴¹⁰	11.27 ²⁶⁵	10.642 ²⁷³	41.61 ¹³⁷	39.894 ²⁸⁴	54.31 ²³⁷	27.93 ⁵⁵	12.61 ⁷
20.8	55.912 ⁴⁵²	8.92 ²³⁵	10.921 ²⁷⁹	43.21 ¹⁶⁰	40.205 ³¹¹	52.05 ²²⁶	28.53 ⁶⁰	12.29 ³⁵
30.8	56.393 ⁴⁸¹	6.93 ¹⁹⁹	11.215 ²⁹⁴	44.98 ¹⁷⁷	40.537 ³³²	49.94 ²¹¹	29.15 ⁶²	12.49 ²⁰
June 9.8	56.894 ⁵⁰¹	5.37 ¹⁵⁶	11.521 ³⁰⁶	46.88 ¹⁹⁰	40.882 ³¹⁵	48.03 ¹⁹¹	29.79 ⁶¹	13.28 ⁷⁹
19.7	57.404 ⁵¹⁰	4.26 ¹¹¹	11.826 ³⁰⁵	48.86 ¹⁹⁸	41.232 ³⁵⁶	46.41 ¹⁶²	30.42 ⁶³	14.61 ¹³³
29.7	57.906 ⁵⁰²	3.61 ⁶⁵	12.126 ³⁰⁰	50.86 ²⁰⁰	41.577 ³¹⁵	45.08 ¹³³	31.02 ⁶⁰	16.43 ¹⁸²
July 9.7	58.390 ⁴⁸⁴	3.51 ¹⁰	12.412 ²⁸⁶	52.84 ¹⁹⁸	41.907 ³³⁰	44.08 ¹⁰⁰	31.58 ⁵⁶	18.74 ²³¹
19.6	58.840 ⁴⁵⁰	3.82 ³¹	12.675 ²⁶³	54.74 ¹⁹⁰	42.216 ³⁰⁹	43.48 ⁶⁰	32.08 ⁵⁰	21.42 ²⁴³
29.6	59.244 ⁴⁰¹	4.66 ⁸⁴	12.911 ²³⁶	56.51 ¹⁷⁷	42.492 ²⁷⁶	43.22 ²⁶	32.52 ⁴¹	24.45 ³⁰³
Aug. 8.6	59.593 ³¹⁹	5.96 ¹³⁰	13.112 ²⁰¹	58.11 ¹⁶⁰	42.733 ²¹¹	43.36 ¹⁴	32.88 ³⁶	27.75 ³³⁰
18.6	59.874 ²⁸¹	7.67 ¹⁷¹	13.275 ¹⁶³	59.53 ¹¹²	42.928 ¹⁹⁵	43.84 ⁴⁸	33.16 ²⁸	31.23 ³¹⁸
28.5	60.082 ²⁰⁸	9.70 ²⁰³	13.399 ¹²⁴	60.71 ¹¹⁸	43.075 ¹⁴⁷	44.68 ⁸⁴	33.35 ¹⁹	34.83 ³⁶⁰
Sept. 7.5	60.212 ¹³⁰	12.04 ²³⁴	13.481 ⁸²	61.68 ⁹⁷	43.175 ¹⁰⁰	45.80 ¹¹²	33.45 ¹⁰	38.47 ³⁶¹
17.5	60.265 ⁵³	14.57 ²⁵³	13.525 ⁴⁴	62.40 ⁷²	43.222 ¹⁷	47.17 ¹³⁷	33.46 ¹	42.06 ³⁵⁹
27.5	60.239 ²⁶	17.17 ²⁶⁰	13.529 ⁴	62.89 ⁴⁹	43.223 ¹	48.72 ¹⁵⁵	33.38 ⁸	45.53 ³¹⁷
Oct. 7.4	60.139 ¹⁰⁰	19.77 ²⁶⁰	13.500 ²⁹	63.16 ²⁷	43.182 ⁴¹	50.37 ¹⁶⁵	33.22 ¹⁶	48.83 ³³⁰
17.4	59.973 ¹⁶⁶	22.24 ²¹⁷	13.442 ⁵⁸	63.22 ⁶	43.103 ⁷⁹	52.06 ¹⁶⁹	32.99 ²³	51.86 ³⁰³
27.4	59.752 ²²¹	24.52 ²²⁸	13.360 ⁸²	63.10 ¹²	42.990 ¹¹³	53.70 ¹⁶⁴	32.68 ³¹	54.56 ²⁷⁰
Nov. 6.3	59.485 ²⁶⁷	26.48 ¹⁹⁶	13.260 ¹⁰⁰	62.80 ³⁰	42.854 ¹³⁶	55.24 ¹⁵¹	32.32 ³⁶	56.87 ²³¹
16.3	59.188 ²⁹⁷	28.04 ¹⁵⁶	13.148 ¹¹²	62.37 ⁴³	42.702 ¹⁵²	56.60 ¹³⁶	31.90 ⁴²	58.72 ¹⁸⁵
26.3	58.872 ³¹⁶	29.16 ¹¹²	13.028 ¹²⁰	61.81 ⁵⁶	42.542 ¹⁶⁰	57.72 ¹¹²	31.44 ⁴⁶	60.03 ¹³¹
Dec. 6.3	58.550 ³²²	29.76 ¹²¹	12.907 ¹²¹	61.13 ⁶⁸	42.379 ¹⁶³	58.58 ⁸⁶	30.96 ⁴⁸	60.79 ⁷⁶
16.2	58.235 ³¹⁵	29.85 ⁹	12.788 ¹¹⁹	60.39 ⁷⁴	42.221 ¹⁵⁸	59.13 ⁵⁵	30.46 ⁵⁰	60.95 ¹⁶
26.2	57.940 ²⁹⁵	29.41 ⁴⁴	12.675 ¹¹³	59.58 ⁸¹	42.072 ¹⁴⁹	59.35 ²²	29.96 ⁵⁰	60.54 ⁴¹
36.2	57.671 ²⁶⁹	28.46 ⁹⁵	12.572 ¹⁰³	58.73 ⁸⁵	41.937 ¹³⁵	59.26 ⁹	29.48 ⁴⁸	59.52 ¹⁰²
Mean Place	56.650	30.68	10.387	40.82	40.147	66.37	27.393	24.17
Sec δ , Tan δ	1.922	-1.642	1.001	+0.050	1.192	-0.648	2.635	+2.437
$D\psi\alpha$, $D\omega\alpha$	+0.070	+0.107	+0.061	-0.003	+0.065	+0.042	+0.049	-0.159
$D\psi\delta$, $D\omega\delta$	+0.39	-0.20	+0.39	-0.20	+0.39	-0.20	+0.39	-0.19

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	τ Pegasi. Mag. 4.6		δ^1 Aquarii. Mag. 4.2		4 Cassiopeiæ. Mag. 5.2		ν Pegasi. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 16 s	° ' " +23 19 "	h m 23 18 s	° ' " -20 30 "	h m 23 21 s	° ' " +61 51 "	h m 23 21 s	° ' " +22 58 "
Jan. 1.2	49.070	14.49	54.864	83.12	24.69	53.16	31.730	54.99
11.2	48.945	13.19	54.753	83.28	24.34	51.81	31.607	53.76
21.1	48.838	11.74	54.666	83.20	24.02	49.94	31.499	52.34
31.1	48.752	10.16	54.596	82.90	23.74	47.66	31.408	50.79
Feb. 10.1	48.689	8.50	54.550	82.35	23.52	45.04	31.342	49.17
20.1	48.655	6.83	54.530	81.58	23.37	42.18	31.305	47.55
Mar. 2.0	48.655	5.25	54.539	80.57	23.29	39.20	31.299	46.02
12.0	48.692	3.86	54.583	79.33	23.29	36.23	31.332	44.63
22.0	48.768	2.70	54.665	77.90	23.38	33.39	31.404	43.47
31.9	48.888	1.79	54.781	76.26	23.56	30.78	31.518	42.59
Apr. 10.9	49.047	1.24	54.934	74.45	23.81	28.49	31.674	42.05
20.9	49.248	1.07	55.126	72.52	24.14	26.65	31.870	41.87
30.9	49.487	1.28	55.354	70.46	24.54	25.29	32.102	42.09
May 10.8	49.753	1.90	55.612	68.36	25.00	24.46	32.367	42.69
20.8	50.046	2.89	55.898	66.24	25.49	24.18	32.657	43.66
30.8	50.356	4.23	56.203	64.16	26.01	24.48	32.967	45.00
June 9.8	50.675	5.90	56.520	62.17	26.54	25.32	33.287	46.65
19.7	50.998	7.82	56.841	60.36	27.07	26.71	33.608	48.56
29.7	51.311	9.97	57.160	58.73	27.58	28.56	33.923	50.70
July 9.7	51.606	12.30	57.463	57.34	28.06	30.88	34.221	52.99
19.6	51.881	14.71	57.747	56.23	28.49	33.55	34.497	55.38
29.6	52.122	17.16	58.003	55.42	28.87	36.54	34.743	57.81
Aug. 8.6	52.330	19.60	58.223	54.93	29.19	39.78	34.953	60.23
18.6	52.496	21.96	58.404	54.75	29.44	43.18	35.125	62.58
28.5	52.621	24.22	58.544	54.87	29.62	46.68	35.255	64.81
Sept. 7.5	52.706	26.33	58.638	55.29	29.72	50.19	35.342	66.89
17.5	52.747	28.24	58.690	55.97	29.75	53.67	35.388	68.77
27.5	52.747	29.90	58.699	56.84	29.72	57.01	35.396	70.43
Oct. 7.4	52.715	31.35	58.671	57.88	29.61	60.17	35.368	71.86
17.4	52.649	32.51	58.608	59.03	29.44	63.06	35.307	73.02
27.4	52.559	33.39	58.518	60.23	29.22	65.62	35.221	73.91
Nov. 6.3	52.445	33.99	58.406	61.42	28.95	67.80	35.115	74.49
16.3	52.317	34.27	58.282	62.55	28.64	69.52	34.991	74.79
26.3	52.180	34.28	58.147	63.57	28.29	70.75	34.858	74.80
Dec. 6.3	52.039	33.95	58.012	64.46	27.93	71.43	34.719	74.51
16.2	51.896	33.34	57.878	65.16	27.55	71.55	34.578	73.92
26.2	51.756	32.47	57.752	65.66	27.17	71.10	34.440	73.07
36.2	51.628	31.31	57.637	65.96	26.80	70.08	34.309	71.96
Mean Place	49.383	6.92	55.676	76.27	24.507	35.69	32.014	47.68
Sec δ , Tan δ	1.089	+0.431	1.068	-0.374	2.121	+1.870	1.086	+0.424
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.028	+0.063	+0.025	+0.053	-0.123	+0.059	-0.028
$D\psi\delta$, $D\omega\delta$	+0.39	-0.19	+0.39	-0.18	+0.39	-0.17	+0.39	-0.17

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	κ Piscium. Mag. 4.9		θ Piscium. Mag. 4.4		70 Pegasi. Mag. 4.7		β Sculptoris. Mag. 4.5	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 22 s	° ' " + 0 49 "	h m 23 24 s	° ' " + 5 57 "	h m 23 25 s	° ' " +12 20 "	h m 23 28 s	° ' " -38 14 "
Jan. 1.2	58.605	62.11	3.228	22.87	15.164	11.90	49.693	52.57
11.2	58.503	61.31	3.122	21.95	15.055	10.85	49.544	52.17
21.1	58.415	60.55	3.031	21.01	14.957	9.73	49.417	51.40
31.1	58.345	59.85	2.958	20.10	14.878	8.57	49.314	50.27
Feb. 10.1	58.294	59.26	2.903	19.23	14.820	7.43	49.241	48.82
20.1	58.270	58.79	2.876	18.49	14.786	6.34	49.197	47.07
Mar. 2.0	58.274	58.49	2.876	17.90	14.783	5.38	49.190	45.06
12.0	58.311	58.42	2.911	17.51	14.816	4.60	49.223	42.84
22.0	58.382	58.56	2.979	17.35	14.883	4.06	49.296	40.43
31.9	58.491	58.98	3.088	17.45	14.991	3.79	49.414	37.88
Apr. 10.9	58.636	59.65	3.235	17.86	15.135	3.82	49.576	35.25
20.9	58.816	60.59	3.414	18.54	15.319	4.17	49.781	32.59
30.9	59.034	61.80	3.632	19.51	15.539	4.86	50.028	29.94
May 10.8	59.280	63.23	3.878	20.76	15.790	5.87	50.311	27.39
20.8	59.554	64.86	4.149	22.25	16.066	7.17	50.628	24.96
30.8	59.845	66.66	4.441	23.93	16.362	8.74	50.969	22.73
June 9.8	60.147	68.58	4.743	25.80	16.668	10.52	51.328	20.75
19.7	60.153	70.55	5.049	27.77	16.978	12.47	51.694	19.08
29.7	60.753	72.54	5.350	29.80	17.283	14.56	52.059	17.76
July 9.7	61.042	74.48	5.639	31.85	17.573	16.70	52.411	16.81
19.6	61.310	76.32	5.907	33.84	17.842	18.86	52.744	16.27
29.6	61.551	78.02	6.145	35.75	18.086	20.96	53.045	16.15
Aug. 8.6	61.759	79.54	6.355	37.48	18.296	22.99	53.309	16.45
18.6	61.931	80.85	6.524	39.04	18.468	24.87	53.529	17.14
28.5	62.063	81.94	6.657	40.42	18.600	26.58	53.701	18.19
Sept. 7.5	62.155	82.79	6.747	41.57	18.693	28.09	53.820	19.56
17.5	62.206	83.39	6.797	42.49	18.744	29.39	53.887	21.19
27.5	62.221	83.76	6.813	43.16	18.758	30.44	53.903	23.00
Oct. 7.4	62.199	83.92	6.791	43.63	18.738	31.28	53.872	24.93
17.4	62.150	83.87	6.745	43.87	18.688	31.85	53.797	26.88
27.4	62.075	83.64	6.670	43.89	18.612	32.21	53.687	28.78
Nov. 6.3	61.981	83.27	6.577	43.75	18.517	32.35	53.549	30.54
16.3	61.873	82.76	6.466	43.42	18.406	32.26	53.388	32.09
26.3	61.755	82.14	6.348	42.93	18.286	31.97	53.216	33.36
Dec. 6.3	61.634	81.45	6.226	42.30	18.161	31.48	53.038	34.32
16.2	61.515	80.70	6.104	41.57	18.035	30.79	52.861	34.92
26.2	61.399	79.92	5.986	40.76	17.913	29.95	52.691	35.14
36.2	61.292	79.11	5.877	39.90	17.797	29.00	52.535	34.97
Mean Place	59.110	62.20	3.671	21.28	15.533	8.19	50.796	40.22
Sec δ , Tan δ	1.000	+0.015	1.005	+0.104	1.024	+0.219	1.273	-0.788
$D\psi\alpha$, $D\omega\alpha$	+0.061	-0.001	+0.061	-0.007	+0.060	-0.014	+0.064	+0.052
$D\psi\delta$, $D\omega\delta$	+0.39	-0.16	+0.39	-0.16	+0.39	-0.15	+0.39	-0.14

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	72 Pegasi (mean). Mag. 5.2		λ Andromedæ. Mag. 4.0		ι Andromedæ. Mag. 4.3		ι Piscium. Mag. 4.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 30 s	° ' " +30 53 "	h m 23 33 s	° ' " +46 2 "	h m 23 34 s	° ' " +42 50 "	h m 23 35 s	° ' " + 5 12 "
Jan. 1.2	7.611	70.58	47.464	40.87	21.300	42.95	58.949	32.60
11.2	7.465	69.30	47.257	39.57	21.109	41.65	58.841	31.71
21.1	7.334	67.76	47.065	37.87	20.933	39.99	58.742	30.83
31.1	7.222	66.02	46.899	35.83	20.779	38.02	58.662	29.97
Feb. 10.1	7.134	64.15	46.765	33.55	20.656	35.83	58.602	29.17
20.1	7.078	62.23	46.670	31.11	20.569	33.48	58.562	28.45
Mar. 2.0	7.058	60.32	46.623	28.60	20.527	31.10	58.554	27.92
12.0	7.077	58.53	46.627	26.14	20.534	28.77	58.575	27.57
22.0	7.140	56.95	46.687	23.82	20.593	26.60	58.636	27.47
Apr. 1.0	7.248	55.63	46.805	21.75	20.706	24.68	58.732	27.58
10.9	7.402	54.64	46.980	20.02	20.875	23.10	58.867	28.01
20.9	7.601	54.03	47.209	18.68	21.095	21.91	59.038	28.71
30.9	7.839	53.84	47.487	17.79	21.360	21.16	59.246	29.68
May 10.8	8.113	54.08	47.809	17.39	21.667	20.88	59.488	30.95
20.8	8.416	54.75	48.164	17.49	22.007	21.11	59.753	32.44
30.8	8.739	55.82	48.542	18.09	22.371	21.80	60.043	34.11
June 9.8	9.075	57.27	48.934	19.16	22.745	22.98	60.344	35.96
19.7	9.412	59.06	49.328	20.69	23.124	24.56	60.651	37.90
29.7	9.743	61.14	49.714	22.62	23.495	26.52	60.955	39.91
July 9.7	10.059	63.45	50.081	24.90	23.849	28.82	61.247	41.92
19.7	10.351	65.93	50.419	27.48	24.175	31.39	61.522	43.87
29.6	10.612	68.53	50.721	30.27	24.466	34.17	61.769	45.73
Aug. 8.6	10.833	71.17	50.981	33.23	24.719	37.08	61.986	47.45
18.6	11.024	73.80	51.194	36.30	24.925	40.08	62.170	48.98
28.5	11.166	76.36	51.356	39.38	25.084	43.07	62.314	50.30
Sept. 7.5	11.265	78.82	51.467	42.43	25.193	46.03	62.418	51.41
17.5	11.319	81.12	51.526	45.39	25.252	48.87	62.483	52.28
27.5	11.331	83.22	51.536	48.19	25.264	51.55	62.511	52.90
Oct. 7.4	11.307	85.09	51.500	50.78	25.233	54.02	62.503	53.29
17.4	11.248	86.68	51.421	53.12	25.163	56.20	62.467	53.49
27.4	11.161	87.98	51.304	55.14	25.056	58.11	62.402	53.47
Nov. 6.4	11.048	88.98	51.156	56.80	24.918	59.66	62.319	53.27
16.3	10.918	89.63	50.981	58.07	24.757	60.81	62.219	52.95
26.3	10.774	89.94	50.787	58.90	24.577	61.55	62.106	52.44
Dec. 6.3	10.621	89.89	50.576	59.28	24.383	61.85	61.989	51.81
16.2	10.463	89.48	50.358	59.18	24.181	61.72	61.869	51.09
26.2	10.306	88.72	50.137	58.61	23.978	61.11	61.751	50.28
36.2	10.154	87.64	49.921	57.58	23.779	60.08	61.640	49.42
Mean Place	7.759	61.04	47.406	27.17	21.284	30.07	59.332	31.76
Sec δ , Tan δ	1.165	+0.599	1.441	+1.037	1.364	+0.928	1.004	+0.091
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.040	+0.058	-0.069	+0.058	-0.061	+0.061	-0.006
$D\psi\delta$, $D\omega\delta$	+0.39	-0.13	+0.40	-0.11	+0.40	-0.11	+0.40	-0.10

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	γ Cephei. Mag. 3.4		κ Andromedæ. Mag. 4.3		ω^2 Aquarii. Mag. 4.6		ζ^1 Aquarii. Mag. 5.3	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 36 s	° ' " +77 11 "	h m 23 36 s	° ' " +43 54 "	h m 23 38 s	° ' " -14 57 "	h m 23 40 s	° ' " -18 41 "
Jan. 1.2	11.66	88.75	36.675	39.73	43.205	80.49	11.922	83.52
11.2	10.77	87.81	36.478	38.45	43.094	80.88	11.806	83.81
21.2	9.95	86.30	36.296	36.79	42.994	81.07	11.702	83.87
31.1	9.22	84.22	36.136	34.82	42.913	81.06	11.614	83.70
Feb. 10.1	8.61	81.72	36.008	32.61	42.851	80.84	11.550	83.27
20.1	8.15	78.87	35.916	30.24	42.810	80.40	11.507	82.62
Mar. 2.0	7.86	75.79	35.869	27.83	42.800	79.72	11.496	81.72
12.0	7.74	72.60	35.872	25.47	42.822	78.83	11.514	80.59
22.0	7.81	69.45	35.928	23.25	42.879	77.70	11.572	79.25
Apr. 1.0	8.06	66.45	36.038	21.29	42.973	76.36	11.665	77.70
10.9	8.50	63.70	36.206	19.65	43.105	74.81	11.799	75.93
20.9	9.08	61.32	36.426	18.40	43.276	73.07	11.970	74.00
30.9	9.82	59.41	36.695	17.58	43.482	71.18	12.178	71.97
May 10.8	10.68	57.97	37.004	17.24	43.723	69.19	12.418	69.85
20.8	11.62	57.08	37.349	17.39	43.992	67.12	12.691	67.68
30.8	12.62	56.81	37.715	18.05	44.285	65.04	12.987	65.55
June 9.8	13.64	57.11	38.096	19.18	44.592	62.99	13.295	63.47
19.7	14.66	57.96	38.479	20.72	44.905	61.02	13.613	61.54
29.7	15.65	59.38	38.856	22.66	45.218	59.20	13.931	59.75
July 9.7	16.59	61.28	39.215	24.95	45.521	57.58	14.239	58.20
19.7	17.45	63.67	39.546	27.50	45.806	56.18	14.529	56.93
29.6	18.20	66.44	39.845	30.28	46.067	55.05	14.796	55.94
Aug. 8.6	18.84	69.54	40.103	33.19	46.297	54.21	15.029	55.28
18.6	19.35	72.94	40.315	36.20	46.491	53.68	15.227	54.93
28.5	19.72	76.51	40.478	39.22	46.645	53.44	15.386	54.92
Sept. 7.5	19.95	80.21	40.590	42.21	46.758	53.50	15.501	55.19
17.5	20.03	83.95	40.654	45.10	46.828	53.83	15.576	55.72
27.5	19.96	87.67	40.669	47.82	46.859	54.40	15.607	56.50
Oct. 7.4	19.75	91.26	40.640	50.35	46.852	55.17	15.601	57.47
17.4	19.40	94.63	40.568	52.61	46.812	56.09	15.560	58.58
27.4	18.93	97.75	40.463	54.57	46.743	57.09	15.491	59.75
Nov. 6.4	18.33	100.53	40.325	56.17	46.654	58.15	15.398	60.96
16.3	17.62	102.88	40.162	57.37	46.547	59.21	15.288	62.14
26.3	16.84	104.71	39.979	58.17	46.428	60.21	15.165	63.24
Dec. 6.3	15.98	106.01	39.781	58.53	46.304	61.14	15.035	64.21
16.2	15.07	106.71	39.575	58.42	46.177	61.95	14.905	64.99
26.2	14.15	106.77	39.366	57.87	46.055	62.60	14.778	65.59
36.2	13.24	106.23	39.162	56.87	45.938	63.08	14.657	66.03
Mean Place	10.514	69.38	36.626	26.63	43.818	74.39	12.580	76.14
Sec δ , Tan δ	4.516	+4.404	1.388	+0.963	1.035	-0.267	1.056	-0.338
$D\psi\alpha$, $D\omega\alpha$	+0.049	-0.292	+0.059	-0.064	+0.062	+0.018	+0.062	+0.022
$D\psi\delta$, $D\omega\delta$	+0.40	-0.10	+0.40	-0.10	+0.40	-0.09	+0.40	-0.09

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ψ Andromedæ. Mag. 5.1		41 H. Cephei. Mag. 5.0		δ Sculptoris. Mag. 4.6		ϕ Pegasi. Mag. 5.2	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 42 s	° ' " +45 59 "	h m 23 44 s	° ' " +67 22 "	h m 23 44 s	° ' " -28 33 "	h m 23 48 s	° ' " +18 41 "
Jan. 1.2	12.882	46.94	13.75	61.76	54.214	34.31	33.907	38.28
11.2	12.670	45.72	13.28	60.76	54.078	34.33	33.782	37.24
21.2	12.474	44.12	12.84	59.21	53.960	34.04	33.665	36.05
31.1	12.301	42.16	12.45	57.17	53.860	33.42	33.561	34.76
Feb. 10.1	12.158	39.96	12.12	54.72	53.781	32.53	33.478	33.41
20.1	12.053	37.56	11.86	51.95	53.729	31.33	33.419	32.09
Mar. 2.0	11.993	35.10	11.70	48.99	53.708	29.90	33.389	30.84
12.0	11.986	32.66	11.64	45.95	53.722	28.19	33.394	29.73
22.0	12.033	30.36	11.68	42.96	53.774	26.27	33.438	28.81
Apr. 1.0	12.141	28.28	11.83	40.12	53.866	24.17	33.522	28.14
10.9	12.305	26.53	12.08	37.57	53.999	21.93	33.649	27.77
20.9	12.525	25.15	12.43	35.38	54.172	19.56	33.817	27.75
30.9	12.796	24.22	12.86	33.63	54.387	17.16	34.024	28.05
May 10.9	13.109	23.75	13.38	32.41	54.635	14.72	34.266	28.71
20.8	13.459	23.78	13.91	31.70	54.918	12.33	34.538	29.72
30.8	13.833	24.33	14.55	31.58	55.224	10.06	34.833	31.03
June 9.8	14.221	25.35	15.18	32.02	55.550	7.95	35.142	32.63
19.7	14.619	26.80	15.82	33.00	55.886	6.06	35.459	34.45
29.7	15.007	28.66	16.44	34.50	56.223	4.41	35.774	36.47
July 9.7	15.379	30.90	17.03	36.49	56.551	3.09	36.078	38.61
19.7	15.724	33.41	17.57	38.90	56.861	2.08	36.364	40.84
29.6	16.035	36.17	18.06	41.70	57.144	1.47	36.626	43.09
Aug. 8.6	16.305	39.11	18.48	44.77	57.398	1.22	36.855	45.29
18.6	16.527	42.14	18.83	48.10	57.615	1.37	37.051	47.43
28.6	16.702	45.22	19.09	51.59	57.786	1.84	37.207	49.44
Sept. 7.5	16.825	48.27	19.27	55.16	57.913	2.66	37.322	51.28
17.5	16.897	51.22	19.36	58.75	57.997	3.78	37.398	52.95
27.5	16.920	54.05	19.36	62.28	58.035	5.10	37.436	54.40
Oct. 7.4	16.896	56.68	19.29	65.67	58.027	6.61	37.439	55.60
17.4	16.829	59.04	19.13	68.85	57.984	8.22	37.410	56.58
27.4	16.724	61.12	18.90	71.75	57.906	9.84	37.352	57.31
Nov. 6.4	16.586	62.85	18.60	74.31	57.805	11.43	37.271	57.78
16.3	16.420	64.20	18.25	76.44	57.679	12.89	37.172	58.02
26.3	16.231	65.11	17.84	78.11	57.541	14.17	37.057	57.99
Dec. 6.3	16.026	65.58	17.40	79.23	57.397	15.26	36.933	57.73
16.3	15.811	65.59	16.93	79.77	57.248	16.05	36.804	57.23
26.2	15.591	65.12	16.45	79.73	57.103	16.61	36.672	56.50
36.2	15.373	64.19	15.97	79.11	56.966	16.80	36.543	55.58
Mean Place	12.758	33.45	13.087	43.81	55.002	23.67	34.072	33.28
Sec δ , Tan δ	1.439	+1.035	2.600	+2.400	1.138	-0.544	1.056	+0.338
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.069	+0.057	-0.160	+0.062	+0.036	+0.061	-0.023
$D\psi\delta$, $D\omega\delta$	+0.40	-0.08	+0.40	-0.07	+0.40	-0.07	+0.40	-0.05

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ρ Cassiopeiæ. Mag. 4.8		Groombridge 4163. Mag. 6.6		ω Piscium. Mag. 4.0	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 50 s	° ' +57 4 "	h m 23 51 s	° ' +73 58 "	h m 23 55 s	° ' + 6 26 "
Jan. 1.2	32.030	31.52	4.95	73.05	21.117	14.02
11.2	31.729 301	30.48 104	4.25 70	72.27 78	21.003 114	13.15 87
21.2	31.443 286	28.95 153	3.60 65	70.88 139	20.895 108	12.28 87
31.1	31.186 257	26.98 197	3.00 60	68.96 192	20.800 95	11.42 86
Feb. 10.1	30.969 217	24.68 230	2.49 51	66.58 238	20.723 77	10.61 81
	167	259	40	275	57	74
20.1	30.802	22.09	2.09	63.83	20.666	9.87
Mar. 2.0	30.694 108	19.36 273	1.82 27	60.86 297	20.637 29	9.30 57
12.0	30.654 40	16.58 278	1.69 13	57.74 312	20.638 1	8.90 40
22.0	30.686 32	13.86 272	1.70 1	54.64 310	20.678 40	8.73 17
Apr. 1.0	30.795 109	11.34 252	1.87 17	51.66 298	20.753 75	8.78 5
	183	224	31	278	117	35
10.9	30.978	9.10	2.18	48.88	20.870	9.13
20.9	31.230 252	7.22 188	2.63 45	46.48 240	21.024 154	9.78 65
30.9	31.548 318	5.78 144	3.19 56	44.47 201	21.218 194	10.65 87
May 10.9	31.922 374	4.83 95	3.87 68	42.97 150	21.448 230	11.84 119
20.8	32.342 420	4.40 43	4.61 74	42.03 94	21.704 256	13.26 142
	453	11	81	41	282	162
30.8	32.795	4.51	5.42	41.62	21.986	14.88
June 9.8	33.266 471	5.14 63	6.26 84	41.78 16	22.283 297	16.69 181
19.7	33.744 478	6.28 114	7.11 85	42.52 74	22.590 307	18.63 194
29.7	34.216 472	7.90 162	7.94 83	43.83 131	22.895 305	20.62 199
July 9.7	34.667 451	9.96 206	8.73 79	45.60 177	23.193 298	22.64 202
	422	243	74	225	284	199
19.7	35.089	12.39	9.47	47.85	23.477	24.63
29.6	35.469 380	15.13 274	10.13 66	50.51 266	23.737 260	26.53 190
Aug. 8.6	35.801 332	18.14 301	10.71 58	53.51 300	23.967 230	28.27 174
18.6	36.076 275	21.32 318	11.18 47	56.81 330	24.166 199	29.90 163
28.6	36.293 217	24.62 330	11.55 37	60.31 350	24.326 160	31.30 140
	155	336	25	363	124	118
Sept. 7.5	36.448	27.98	11.80	63.94	24.450	32.48
17.5	36.540 92	31.31 333	11.93 13	67.63 369	24.534 84	33.43 95
27.5	36.571 31	34.55 324	11.95 2	71.30 367	24.579 45	34.17 74
Oct. 7.4	36.544 27	37.63 308	11.85 10	74.86 356	24.591 12	34.64 47
17.4	36.461 83	40.51 288	11.64 21	78.24 338	24.572 19	34.91 27
	135	258	32	316	46	6
27.4	36.326	43.09	11.32	81.40	24.526	34.97
Nov. 6.4	36.146 180	45.32 223	10.90 42	84.20 280	24.457 69	34.86 11
16.3	35.925 221	47.16 184	10.39 51	86.61 241	24.367 90	34.57 29
26.3	35.670 255	48.55 139	9.81 58	88.56 195	24.266 101	34.12 45
Dec. 6.3	35.390 280	49.44 89	9.16 65	89.95 139	24.153 113	33.59 53
	301	37	69	80	118	68
16.3	35.089	49.81	8.47	90.75	24.035	32.91
26.2	34.780 309	49.64 17	7.76 71	90.97 22	23.916 119	32.15 76
36.2	34.470 310	48.93 71	7.05 71	90.57 40	23.800 116	31.32 83
Mean Place	31.615	15.66	3.771	54.37	21.376	13.52
Sec δ , Tan δ	1.840	+1.544	3.625	+3.484	1.006	+0.113
$D\psi\alpha$, $D\omega\alpha$	+0.059	-0.103	+0.058	-0.232	+0.061	-0.008
$D\psi\delta$, $D\omega\delta$	+0.40	-0.04	+0.40	-0.04	+0.40	-0.02

FOR THE UPPER TRANSIT AT WASHINGTON.

Washington Mean Time.	ϵ Tucanæ. Mag. 4.7		30 Piscium. Mag. 4.7		2 Ceti. Mag. 4.6	
	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.	Right Ascension.	Declina- tion.
	h m 23 55 s	° ' -65 59 "	h m 23 57 s	° ' - 6 26 "	h m 23 59 s	° ' -17 45 "
Jan. 1.2	53.40	98.05	60.288	35.28	47.266	61.04
11.2	52.99 41	97.02 103	60.173 115	35.90 62	47.143 123	61.42 38
21.2	52.62 37	95.47 155	60.068 105	36.42 52	47.031 112	61.56 14
31.1	52.32 30	93.42 205	59.973 95	36.79 37	46.931 100	61.48 8
Feb. 10.1	52.04 28	90.94 248	59.897 76	37.01 22	46.849 82	61.15 33
	20 20	286	55	3	59	57
20.1	51.84 12	88.08 313	59.842 31	37.04 16	46.790 32	60.58 82
Mar. 2.1	51.72 5	84.95 377	59.811 1	36.88 38	46.758 3	59.76 106
12.0	51.67 3	81.58 350	59.812 35	36.50 62	46.755 34	58.70 129
22.0	51.70 11	78.08 357	59.847 73	35.88 85	46.789 72	57.41 152
Apr. 1.0	51.81 19	74.51 355	59.920 114	35.03 109	46.861 110	55.89 172
10.9	52.00 28	70.96 316	60.034 150	33.94 132	46.971 151	54.17 190
20.9	52.28 35	67.50 329	60.184 187	32.62 153	47.122 190	52.27 204
30.9	52.63 42	64.21 307	60.371 224	31.09 172	47.312 227	50.23 215
May 10.9	53.05 49	61.14 277	60.595 253	29.37 186	47.539 258	48.08 220
20.8	53.54 54	58.37 237	60.848 279	27.51 196	47.797 284	45.88 220
30.8	54.08 58	56.00 197	61.127 297	25.55 201	48.081 303	43.68 213
June 9.8	54.66 60	54.03 151	61.424 306	23.54 203	48.384 314	41.55 204
19.8	55.26 62	52.52 99	61.730 307	21.51 194	48.698 317	39.51 188
29.7	55.88 61	51.53 43	62.037 301	19.57 184	49.015 311	37.63 166
July 9.7	56.49 58	51.10 10	62.338 286	17.73 171	49.326 296	35.97 140
19.7	57.07 55	51.20 64	62.624 264	16.02 150	49.622 275	34.57 110
29.6	57.62 49	51.84 117	62.888 234	14.52 126	49.897 246	33.47 80
Aug. 8.6	58.11 42	53.01 165	63.122 204	13.26 101	50.143 213	32.67 46
18.6	58.53 34	54.66 206	63.326 165	12.25 74	50.356 174	32.21 13
28.6	58.87 25	56.72 245	63.491 128	11.51 44	50.530 133	32.08 18
Sept. 7.5	59.12 15	59.17 268	63.619 88	11.07 20	50.663 93	32.26 47
17.5	59.27 5	61.85 287	63.707 49	10.87 6	50.756 52	32.73 74
27.5	59.32 4	64.72 292	63.756 14	10.93 28	50.808 13	33.47 93
Oct. 7.5	59.28 14	67.64 286	63.770 20	11.21 49	50.821 21	34.40 110
17.4	59.14 23	70.50 270	63.750 45	11.70 61	50.800 52	35.50 120
27.4	58.91 29	73.20 241	63.705 71	12.31 74	50.748 76	36.70 124
Nov. 6.4	58.62 36	75.61 204	63.634 89	13.05 82	50.672 97	37.94 122
16.3	58.26 40	77.65 156	63.545 102	13.87 84	50.575 111	39.16 115
26.3	57.86 42	79.21 106	63.443 113	14.71 85	50.464 122	40.31 104
Dec. 6.3	57.44 44	80.27 49	63.330 117	15.56 81	50.342 126	41.35 90
16.3	57.00 43	80.76 9	63.213 119	16.37 76	50.216 128	42.25 70
26.2	56.57 42	80.67 68	63.094 116	17.13 68	50.088 125	42.95 51
36.2	56.15	79.99	62.978	17.81	49.963	43.46
Mean Place	55.556	78.82	60.676	31.16	47.788	53.03
Sec δ , Tan δ	2.459	-2.246	1.006	-0.113	1.050	-0.320
$D\psi\alpha$, $D\omega\alpha$	+0.062	+0.150	+0.061	+0.008	+0.061	+0.021
$D\psi\delta$, $D\omega\delta$	+0.40	-0.02	+0.40	-0.01	+0.40	0.00

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ' "	"	m s	s	' "	m s	h m s
Jan.	1	18 44 45.23	11.044	-23 2 52.7	+11.81	+ 3 26.67	+1.184	16 17.90	1 11.06	18 41 17.98
	2	18 49 10.13	11.031	22 57 55.6	12.95	3 54.94	1.171	16 17.91	1 11.02	18 45 14.54
	3	18 53 34.69	11.016	22 52 31.0	14.09	4 22.87	1.156	16 17.91	1 10.97	18 49 11.10
	4	18 57 58.88	11.000	22 46 39.1	15.23	4 50.44	1.140	16 17.90	1 10.92	18 53 7.66
	5	19 2 22.69	10.983	22 40 20.0	16.36	5 17.61	1.123	16 17.88	1 10.87	18 57 4.21
	6	19 6 46.08	10.965	-22 33 33.9	+17.48	+ 5 44.37	+1.106	16 17.86	1 10.81	19 1 0.77
	7	19 11 9.03	10.917	22 26 21.0	18.59	6 10.68	1.087	16 17.83	1 10.74	19 4 57.33
	8	19 15 31.51	10.927	22 18 41.5	19.69	6 36.54	1.067	16 17.80	1 10.67	19 8 53.88
	9	19 19 53.51	10.906	22 10 35.8	20.78	7 1.92	1.046	16 17.77	1 10.60	19 12 50.44
	10	19 24 15.00	10.884	22 2 3.9	21.87	7 26.78	1.024	16 17.72	1 10.53	19 16 47.00
	11	19 28 35.94	10.861	-21 53 6.1	+22.94	+ 7 51.10	+1.002	16 17.67	1 10.45	19 20 43.55
	12	19 32 56.32	10.837	21 43 42.7	24.00	8 14.86	0.978	16 17.62	1 10.37	19 24 40.11
	13	19 37 16.12	10.811	21 33 54.0	25.05	8 38.03	0.953	16 17.57	1 10.28	19 28 36.67
	14	19 41 35.30	10.785	21 23 40.3	26.09	9 0.60	0.927	16 17.51	1 10.20	19 32 33.22
	15	19 45 53.84	10.759	21 13 1.9	27.11	9 22.53	0.900	16 17.44	1 10.11	19 36 29.78
	16	19 50 11.72	10.731	-21 1 59.0	+28.12	+ 9 43.80	+0.872	16 17.37	1 10.01	19 40 26.34
	17	19 54 28.92	10.702	20 50 31.9	29.12	10 4.38	0.843	16 17.30	1 9.92	19 44 22.89
	18	19 58 45.42	10.672	20 38 41.1	30.11	10 24.26	0.814	16 17.22	1 9.82	19 48 19.45
	19	20 3 1.18	10.641	20 26 26.9	31.08	10 43.41	0.783	16 17.14	1 9.72	19 52 16.00
	20	20 7 16.20	10.610	20 13 49.5	32.03	11 1.83	0.751	16 17.06	1 9.62	19 56 12.56
	21	20 11 30.45	10.578	-20 0 49.4	+32.97	+11 19.49	+0.719	16 16.98	1 9.52	20 0 9.12
	22	20 15 43.94	10.545	19 47 26.9	33.90	11 36.37	0.687	16 16.89	1 9.42	20 4 5.67
	23	20 19 56.64	10.512	19 33 42.3	34.81	11 52.46	0.651	16 16.79	1 9.31	20 8 2.23
	24	20 24 8.53	10.479	19 19 36.0	35.71	12 7.76	0.621	16 16.69	1 9.20	20 11 58.78
	25	20 28 19.62	10.445	19 5 8.5	36.59	12 22.25	0.587	16 16.59	1 9.09	20 15 55.34
	26	20 32 29.89	10.411	-18 50 20.0	+37.45	+12 35.93	+0.553	16 16.48	1 8.98	20 19 51.90
	27	20 36 39.34	10.377	18 35 11.0	38.30	12 48.78	0.519	16 16.36	1 8.87	20 23 48.45
	28	20 40 47.96	10.342	18 19 41.8	39.13	13 0.81	0.484	16 16.24	1 8.76	20 27 45.01
	29	20 44 55.75	10.308	18 3 52.8	39.94	13 12.02	0.450	16 16.12	1 8.64	20 31 41.56
	30	20 49 2.71	10.273	17 47 44.5	40.74	13 22.39	0.415	16 15.99	1 8.53	20 35 38.12
Feb.	31	20 53 8.83	10.238	-17 31 17.1	+41.52	+13 31.93	+0.381	16 15.86	1 8.41	20 39 34.67
	1	20 57 14.13	10.204	17 14 31.1	42.29	13 40.66	0.347	16 15.72	1 8.30	20 43 31.23
	2	21 1 18.61	10.170	16 57 26.8	43.04	13 48.57	0.313	16 15.57	1 8.18	20 47 27.78
	3	21 5 22.27	10.136	16 40 4.8	43.78	13 55.65	0.279	16 15.42	1 8.07	20 51 24.34
	4	21 9 25.12	10.102	16 22 25.3	44.50	14 1.92	0.245	16 15.25	1 7.95	20 55 20.89
	5	21 13 27.16	10.069	-16 4 28.7	+45.21	+14 7.39	+0.212	16 15.09	1 7.84	20 59 17.44
	6	21 17 28.41	10.036	15 46 15.5	45.89	14 12.08	0.179	16 14.92	1 7.72	21 3 14.00
	7	21 21 28.87	10.003	15 27 46.1	46.56	14 15.98	0.146	16 14.74	1 7.61	21 7 10.55
	8	21 25 28.55	9.970	15 9 0.8	47.21	14 19.09	0.113	16 14.57	1 7.50	21 11 7.11
	9	21 29 27.45	9.938	14 50 0.0	47.84	14 21.42	0.081	16 14.39	1 7.38	21 15 3.66
	10	21 33 25.57	9.906	-14 30 44.3	+48.45	+14 22.99	+0.049	16 14.20	1 7.27	21 19 0.22
	11	21 37 22.93	9.874	14 11 14.1	49.05	14 23.80	+0.018	16 14.02	1 7.16	21 22 56.77
	12	21 41 19.53	9.842	13 51 29.7	49.63	14 23.85	-0.014	16 13.83	1 7.05	21 26 53.32
	13	21 45 15.37	9.811	13 31 31.6	50.20	14 23.14	0.045	16 13.64	1 6.94	21 30 49.88
	14	21 49 10.47	9.780	13 11 20.2	50.74	14 21.69	0.076	16 13.44	1 6.84	21 34 46.43
	15	21 53 4.83	9.750	-12 50 55.9	+51.27	+14 19.50	-0.106	16 13.24	1 6.73	21 38 42.98
	16	21 56 58.45	9.719	-12 30 19.2	+51.78	+14 16.57	-0.136	16 13.04	1 6.63	21 42 39.54

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Feb. 16	21 56 58.45	9.719	-12 30 19.2	+51.78	+14 16.57	-0.136	16 13.04	1 6.63	21 42 39.54
17	22 0 51.34	9.689	12 9 30.5	52.27	14 12.92	0.166	16 12.84	1 6.52	21 46 36.09
18	22 4 43.52	9.659	11 48 30.2	52.74	14 8.56	0.196	16 12.64	1 6.42	21 50 32.64
19	22 8 35.00	9.630	11 27 18.8	53.20	14 3.50	0.225	16 12.43	1 6.32	21 54 29.20
20	22 12 25.78	9.602	11 5 56.7	53.64	13 57.74	0.254	16 12.22	1 6.23	21 58 25.75
21	22 16 15.88	9.574	-10 44 24.3	+54.06	+13 51.30	-0.282	16 12.01	1 6.13	22 2 22.30
22	22 20 5.31	9.546	10 22 42.0	54.46	13 44.20	0.310	16 11.79	1 6.04	22 6 18.86
23	22 23 54.08	9.519	10 0 50.2	54.81	13 36.44	0.337	16 11.58	1 5.95	22 10 15.41
24	22 27 42.21	9.493	9 38 49.4	55.21	13 28.04	0.363	16 11.36	1 5.86	22 14 11.96
25	22 31 29.72	9.467	9 16 39.9	55.56	13 19.02	0.388	16 11.13	1 5.77	22 18 8.51
26	22 35 16.63	9.442	- 8 54 22.2	+55.90	+13 9.40	-0.413	16 10.91	1 5.69	22 22 5.07
27	22 39 2.95	9.418	8 31 56.6	56.22	12 59.19	0.437	16 10.68	1 5.60	22 26 1.62
28	22 42 48.69	9.394	8 9 23.5	56.52	12 48.41	0.461	16 10.45	1 5.52	22 29 58.17
Mar. 1	22 46 33.88	9.372	7 46 43.4	56.81	12 37.09	0.483	16 10.21	1 5.45	22 33 54.72
2	22 50 18.56	9.351	7 23 56.6	57.09	12 25.21	0.504	16 9.97	1 5.38	22 37 51.28
3	22 54 2.73	9.331	- 7 1 3.4	+57.34	+12 12.90	0.521	16 9.73	1 5.31	22 41 47.83
4	22 57 46.42	9.311	6 38 4.4	57.58	12 0.07	0.544	16 9.48	1 5.24	22 45 44.38
5	23 1 29.65	9.292	6 14 59.7	57.80	11 46.78	0.563	16 9.23	1 5.17	22 49 40.93
6	23 5 12.45	9.275	5 51 49.8	58.01	11 33.07	0.580	16 8.97	1 5.11	22 53 37.48
7	23 8 54.85	9.259	5 28 35.1	58.21	11 18.95	0.596	16 8.71	1 5.05	22 57 34.04
8	23 12 36.85	9.213	- 5 5 16.0	+58.39	+11 4.44	-0.612	16 8.45	1 4.99	23 1 30.59
9	23 16 18.49	9.228	4 41 52.8	58.55	10 49.57	0.627	16 8.19	1 4.93	23 5 27.14
10	23 19 59.78	9.214	4 18 25.7	58.69	10 34.36	0.641	16 7.92	1 4.88	23 9 23.69
11	23 23 40.74	9.200	3 54 55.4	58.82	10 18.81	0.654	16 7.66	1 4.83	23 13 20.24
12	23 27 21.40	9.187	3 31 22.3	58.93	10 2.95	0.667	16 7.39	1 4.78	23 17 16.80
13	23 31 1.76	9.176	- 3 7 46.6	+59.03	+ 9 46.80	-0.678	16 7.12	1 4.74	23 21 13.35
14	23 34 41.85	9.165	2 44 8.6	59.11	9 30.38	0.689	16 6.86	1 4.69	23 25 9.90
15	23 38 21.68	9.155	2 20 28.9	59.18	9 13.71	0.700	16 6.59	1 4.65	23 29 6.45
16	23 42 1.27	9.145	1 56 47.8	59.23	8 56.79	0.710	16 6.32	1 4.62	23 33 3.00
17	23 45 40.64	9.136	1 33 5.7	59.26	8 39.65	0.718	16 6.05	1 4.59	23 36 59.56
18	23 49 19.80	9.128	- 1 9 23.0	+59.28	+ 8 22.31	-0.726	16 5.78	1 4.56	23 40 56.11
19	23 52 58.77	9.121	0 45 40.0	59.29	8 4.78	0.733	16 5.51	1 4.54	23 44 52.66
20	23 56 37.58	9.114	- 0 21 57.2	59.27	7 47.09	0.740	16 5.24	1 4.52	23 48 49.21
21	0 0 16.23	9.108	+ 0 1 45.1	59.24	7 29.24	0.746	16 4.97	1 4.50	23 52 45.76
22	0 3 54.75	9.103	0 25 26.6	59.20	7 11.26	0.752	16 4.70	1 4.48	23 56 42.31
23	0 7 33.15	9.098	+ 0 49 6.8	+59.14	+ 6 53.16	-0.756	16 4.43	1 4.47	0 0 38.86
24	0 11 11.45	9.091	1 12 45.3	59.06	6 34.96	0.760	16 4.16	1 4.46	0 4 35.42
25	0 14 49.67	9.092	1 36 21.9	58.97	6 16.63	0.763	16 3.90	1 4.44	0 8 31.97
26	0 18 27.83	9.090	1 59 56.1	58.86	5 58.34	0.765	16 3.63	1 4.44	0 12 28.52
27	0 22 5.96	9.088	2 23 27.6	58.74	5 39.96	0.766	16 3.36	1 4.44	0 16 25.07
28	0 25 44.07	9.088	+ 2 46 56.0	+58.61	+ 5 21.57	-0.766	16 3.08	1 4.44	0 20 21.62
29	0 29 22.18	9.088	3 10 21.0	58.46	5 3.18	0.766	16 2.81	1 4.45	0 24 18.17
30	0 33 0.32	9.090	3 33 42.3	58.30	4 44.82	0.764	16 2.54	1 4.45	0 28 14.73
31	0 36 38.51	9.093	3 56 59.5	58.12	4 26.51	0.761	16 2.26	1 4.46	0 32 11.28
Apr. 1	0 40 16.77	9.096	4 20 12.3	57.93	4 8.27	0.758	16 1.99	1 4.47	0 36 7.83
2	0 43 55.13	9.101	+ 4 43 20.3	+57.73	+ 3 50.12	-0.754	16 1.71	1 4.49	0 40 4.38
3	0 47 33.61	9.106	+ 5 6 23.4	+57.51	+ 3 32.10	-0.748	16 1.43	1 4.51	0 44 0.93

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.		Var. per Hour.	Semi-diameter.		S. T. of Sem. Pass. Merid.		Sidereal Time of Mean Noon.		
	h	m	s		°	'	"		m	s		'	"	m	s	h	m	s
Apr.	1	0	40 16.77	9.096	+	4	20 12.3	+57.93	+	4	8.27	-0.758	16 1.99	1 4.47		0	36	7.83
	2	0	43 55.13	9.101		4	43 20.3	57.73		3	50.12	0.754	16 1.71	1 4.49		0	40	4.38
	3	0	47 33.61	9.106		5	6 23.4	57.51		3	32.10	0.748	16 1.43	1 4.51		0	44	0.93
	4	0	51 12.25	9.113		5	29 21.1	57.28		3	14.23	0.741	16 1.15	1 4.53		0	47	57.49
	5	0	54 51.05	9.121		5	52 13.0	57.04		2	56.53	0.733	16 0.87	1 4.56		0	51	54.04
	6	0	58 30.04	9.129	+	6	14 59.0	+56.78	+	2	39.02	-0.725	16 0.59	1 4.59		0	55	50.59
	7	1	2 9.24	9.138		6	37 38.6	56.51		2	21.71	0.716	16 0.31	1 4.62		0	59	47.14
	8	1	5 48.67	9.148		7	0 11.4	56.22		2	4.63	0.707	16 0.02	1 4.65		1	3	43.70
	9	1	9 28.35	9.159		7	22 37.2	55.92		1	47.81	0.696	15 59.74	1 4.68		1	7	40.25
	10	1	13 8.30	9.170		7	44 55.7	55.61		1	31.25	0.684	15 59.47	1 4.72		1	11	36.80
	11	1	16 48.52	9.182	+	8	7 6.4	+55.28	+	1	14.96	-0.672	15 59.19	1 4.76		1	15	33.35
	12	1	20 29.03	9.195		8	29 8.9	54.93		0	58.96	0.660	15 58.91	1 4.80		1	19	29.90
	13	1	24 9.85	9.208		8	51 3.1	54.57		0	43.27	0.647	15 58.64	1 4.84		1	23	26.46
	14	1	27 50.99	9.221		9	12 48.6	54.20		0	27.91	0.634	15 58.37	1 4.89		1	27	23.01
	15	1	31 32.46	9.235		9	34 24.8	53.81	+	0	12.87	0.620	15 58.10	1 4.94		1	31	19.56
	16	1	35 14.29	9.250	+	9	55 51.5	+53.41	-	0	1.83	-0.605	15 57.83	1 4.99		1	35	16.11
	17	1	38 56.47	9.265		10	17 8.5	52.99		0	16.16	0.590	15 57.56	1 5.04		1	39	12.67
	18	1	42 39.02	9.281		10	38 15.3	52.56		0	30.12	0.574	15 57.30	1 5.10		1	43	9.22
	19	1	46 21.95	9.297		10	59 11.5	52.11		0	43.70	0.558	15 57.04	1 5.16		1	47	5.77
	20	1	50 5.28	9.314		11	19 56.9	51.65		0	56.89	0.541	15 56.78	1 5.22		1	51	2.33
	21	1	53 49.01	9.331	+	11	40 31.0	+51.18	-	1	9.68	-0.521	15 56.53	1 5.28		1	54	58.88
	22	1	57 33.15	9.348		12	0 53.6	50.69		1	22.05	0.506	15 56.28	1 5.34		1	58	55.43
	23	2	1 17.72	9.366		12	21 4.3	50.19		1	34.00	0.489	15 56.03	1 5.41		2	2	51.98
	24	2	5 2.73	9.385		12	41 2.8	49.67		1	45.52	0.471	15 55.78	1 5.48		2	6	48.54
	25	2	8 48.18	9.404		13	0 48.7	49.14		1	56.59	0.452	15 55.53	1 5.55		2	10	45.09
	26	2	12 34.10	9.423	+	13	20 21.7	+48.60	-	2	7.20	-0.433	15 55.29	1 5.62		2	14	41.64
	27	2	16 20.49	9.443		13	39 41.4	48.04		2	17.34	0.413	15 55.04	1 5.69		2	18	38.20
	28	2	20 7.36	9.463		13	58 47.7	47.47		2	26.99	0.392	15 54.80	1 5.77		2	22	34.75
	29	2	23 54.73	9.481		14	17 40.1	46.89		2	36.15	0.371	15 54.56	1 5.84		2	26	31.30
	30	2	27 42.61	9.506		14	36 18.4	46.30		2	44.79	0.349	15 54.31	1 5.92		2	30	27.86
May	1	2	31 31.01	9.528	+	14	54 42.3	+45.69	-	2	52.92	-0.327	15 54.07	1 5.99		2	34	24.41
	2	2	35 19.96	9.551		15	12 51.4	45.07		3	0.51	0.305	15 53.83	1 6.07		2	38	20.97
	3	2	39 9.46	9.574		15	30 45.4	44.43		3	7.55	0.282	15 53.59	1 6.15		2	42	17.52
	4	2	42 59.52	9.598		15	48 24.2	43.79		3	14.03	0.258	15 53.36	1 6.23		2	46	14.08
	5	2	46 50.15	9.622		16	5 47.3	43.13		3	19.94	0.234	15 53.12	1 6.31		2	50	10.63
	6	2	50 41.36	9.646	+	16	22 54.5	+42.46	-	3	25.27	-0.210	15 52.89	1 6.39		2	54	7.18
	7	2	54 33.15	9.670		16	39 45.4	41.78		3	30.02	0.186	15 52.66	1 6.47		2	58	3.74
	8	2	58 25.52	9.694		16	56 19.8	41.08		3	34.18	0.161	15 52.43	1 6.55		3	2	0.29
	9	3	2 18.49	9.719		17	12 37.4	40.37		3	37.76	0.137	15 52.20	1 6.64		3	5	56.85
	10	3	6 12.05	9.744		17	28 37.9	39.65		3	40.75	0.112	15 51.97	1 6.72		3	9	53.40
	11	3	10 6.19	9.768	+	17	44 20.9	+38.92	-	3	43.15	-0.088	15 51.76	1 6.80		3	13	49.96
	12	3	14 0.93	9.793		17	59 46.1	38.18		3	44.96	0.064	15 51.55	1 6.88		3	17	46.51
	13	3	17 56.26	9.817		18	14 53.2	37.42		3	46.19	0.039	15 51.34	1 6.96		3	21	43.07
	14	3	21 52.16	9.841		18	29 42.0	36.64		3	46.84	-0.015	15 51.13	1 7.04		3	25	39.62
	15	3	25 48.63	9.865		18	44 12.2	35.86		3	46.92	+0.009	15 50.92	1 7.13		3	29	36.18
	16	3	29 45.68	9.889	+	18	58 23.4	+35.07	-	3	46.43	+0.032	15 50.72	1 7.21		3	33	32.73
	17	3	33 43.30	9.913	+	19	12 15.5	+34.26	-	3	45.37	+0.056	15 50.53	1 7.29		3	37	29.28

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0°.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.			Var. per Hour.	Apparent Declination.			Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.					
	h	m	s	s	°	'	"	"	m	s	s	'	"	m	s	h	m	s
May	17	3	33	43.30	9.913	+19	12	15.5	+34.26	-3	45.37	+0.056	15 50.53	1	7.29	3	37	29.28
	18	3	37	41.48	9.936	19	25	48.0	33.44	3	43.75	0.079	15 50.34	1	7.37	3	41	25.84
	19	3	41	40.21	9.958	19	39	0.7	32.61	3	41.58	0.102	15 50.15	1	7.45	3	45	22.40
	20	3	45	39.48	9.981	19	51	53.4	31.77	3	38.87	0.124	15 49.97	1	7.52	3	49	18.95
	21	3	49	39.28	10.003	20	4	25.7	30.92	3	35.64	0.146	15 49.79	1	7.60	3	53	15.51
	22	3	53	39.60	10.024	+20	16	37.5	+30.05	-3	31.89	+0.167	15 49.62	1	7.68	3	57	12.06
	23	3	57	40.44	10.045	20	28	28.4	29.18	3	27.62	0.188	15 49.45	1	7.75	4	1	8.62
	24	4	1	41.78	10.066	20	39	58.3	28.30	3	22.84	0.209	15 49.29	1	7.82	4	5	5.17
	25	4	5	43.61	10.086	20	51	6.8	27.41	3	17.58	0.229	15 49.13	1	7.89	4	9	1.73
	26	4	9	45.92	10.106	21	1	53.8	26.51	3	11.84	0.249	15 48.97	1	7.96	4	12	58.29
	27	4	13	48.71	10.126	+21	12	19.0	+25.59	-3	5.62	+0.269	15 48.81	1	8.03	4	16	54.84
	28	4	17	51.97	10.145	21	22	22.2	24.67	2	58.93	0.288	15 48.65	1	8.10	4	20	51.40
June	29	4	21	55.69	10.164	21	32	3.3	23.74	2	51.79	0.307	15 48.50	1	8.16	4	24	47.95
	30	4	25	59.86	10.183	21	41	21.9	22.81	2	44.19	0.326	15 48.35	1	8.23	4	28	44.51
	31	4	30	4.48	10.201	21	50	18.0	21.86	2	36.15	0.344	15 48.20	1	8.29	4	32	41.07
	1	4	34	9.53	10.219	+21	58	51.3	+20.91	-2	27.68	+0.362	15 48.05	1	8.35	4	36	37.62
	2	4	38	15.01	10.236	22	7	1.7	19.35	2	18.79	0.379	15 47.91	1	8.40	4	40	34.18
	3	4	42	20.89	10.253	22	14	49.0	18.98	2	9.49	0.396	15 47.77	1	8.46	4	44	30.74
	4	4	46	27.16	10.269	22	22	13.0	18.01	1	59.80	0.412	15 47.63	1	8.51	4	48	27.29
	5	4	50	33.82	10.285	22	29	13.7	17.04	1	49.73	0.427	15 47.50	1	8.56	4	52	23.85
	6	4	54	40.84	10.299	+22	35	50.8	+16.05	-1	39.30	+0.442	15 47.37	1	8.60	4	56	20.40
	7	4	58	48.19	10.313	22	42	4.2	15.06	1	28.53	0.456	15 47.24	1	8.65	5	0	16.96
	8	5	2	55.87	10.326	22	47	53.7	14.06	1	17.44	0.469	15 47.12	1	8.69	5	4	13.52
	9	5	7	3.85	10.338	22	53	19.3	13.06	1	6.05	0.480	15 47.01	1	8.73	5	8	10.07
10	5	11	12.10	10.349	22	58	20.8	12.05	0	54.38	0.491	15 46.90	1	8.76	5	12	6.63	
11	5	15	20.61	10.359	+23	2	58.0	+11.04	-0	42.47	+0.501	15 46.79	1	8.79	5	16	3.19	
12	5	19	29.35	10.368	23	7	10.9	10.03	0	30.32	0.510	15 46.69	1	8.82	5	19	59.74	
13	5	23	38.29	10.376	23	10	59.4	9.01	0	17.97	0.518	15 46.60	1	8.84	5	23	56.30	
14	5	27	47.40	10.383	23	14	23.4	7.99	-0	5.44	0.525	15 46.50	1	8.86	5	27	52.86	
15	5	31	56.67	10.389	23	17	22.9	6.97	+0	7.25	0.531	15 46.42	1	8.88	5	31	49.42	
16	5	36	6.07	10.394	+23	19	57.8	+5.94	+0	20.05	+0.536	15 46.34	1	8.90	5	35	45.97	
17	5	40	15.57	10.397	23	22	7.9	4.91	0	32.95	0.539	15 46.27	1	8.92	5	39	42.53	
18	5	44	25.14	10.399	23	23	53.3	3.88	0	45.92	0.541	15 46.20	1	8.93	5	43	39.08	
19	5	48	34.75	10.401	23	25	13.9	2.84	0	58.94	0.543	15 46.14	1	8.93	5	47	35.64	
20	5	52	44.38	10.401	23	26	9.7	1.81	1	11.98	0.543	15 46.08	1	8.94	5	51	32.20	
21	5	56	53.99	10.400	+23	26	40.7	+0.78	+1	25.01	+0.542	15 46.03	1	8.94	5	55	28.76	
22	6	1	3.57	10.398	23	26	47.0	-0.26	1	38.00	0.540	15 45.98	1	8.94	5	59	25.31	
23	6	5	13.11	10.395	23	26	28.4	1.29	1	50.93	0.537	15 45.93	1	8.93	6	3	21.87	
24	6	9	22.56	10.392	23	25	45.0	2.32	2	3.79	0.534	15 45.89	1	8.91	6	7	18.43	
25	6	13	31.91	10.387	23	24	36.8	3.36	2	16.55	0.529	15 45.85	1	8.90	6	11	14.98	
26	6	17	41.13	10.382	+23	23	3.9	-4.39	+2	29.18	+0.521	15 45.82	1	8.90	6	15	11.54	
27	6	21	50.22	10.376	23	21	6.3	5.41	2	41.68	0.518	15 45.79	1	8.88	6	19	8.10	
28	6	25	59.15	10.369	23	18	44.1	6.44	2	54.02	0.511	15 45.76	1	8.85	6	23	4.65	
29	6	30	7.91	10.361	23	15	57.3	7.46	3	6.19	0.503	15 45.74	1	8.82	6	27	1.21	
30	6	34	16.48	10.352	23	12	46.0	8.48	3	18.17	0.495	15 45.72	1	8.79	6	30	57.77	
July	1	6	38	24.83	10.343	+23	9	10.3	-9.50	+3	29.93	+0.486	15 45.70	1	8.76	6	34	54.32
	2	6	42	32.96	10.334	+23	5	10.3	-10.51	+3	41.47	+0.476	15 45.68	1	8.73	6	38	50.88

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.		Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
		h m s	s	° ' "	"	m s	s	' "	m s	h m s
July	1	6 38 24.83	10.343	+23 9 10.3	-9.50	+3 29.93	+0.486	15 45.70	1 8.76	6 34 54.32
	2	6 42 32.96	10.334	23 5 10.3	10.51	3 41.47	0.476	15 45.68	1 8.73	6 38 50.88
	3	6 46 40.84	10.323	23 0 46.0	11.51	3 52.77	0.465	15 45.67	1 8.69	6 42 47.44
	4	6 50 48.45	10.311	22 55 57.6	12.51	4 3.80	0.453	15 45.66	1 8.65	6 46 43.99
	5	6 54 55.78	10.298	22 50 45.3	13.51	4 14.54	0.441	15 45.66	1 8.60	6 50 40.55
	6	6 59 2.79	10.285	+22 45 9.1	-14.50	+4 24.97	+0.428	15 45.66	1 8.56	6 54 37.11
	7	7 3 9.48	10.272	22 39 9.2	15.49	4 35.07	0.414	15 45.66	1 8.51	6 58 33.66
	8	7 7 15.82	10.257	22 32 45.7	16.47	4 44.83	0.399	15 45.67	1 8.46	7 2 30.22
	9	7 11 21.80	10.241	22 25 58.8	17.44	4 54.22	0.383	15 45.68	1 8.40	7 6 26.78
	10	7 15 27.39	10.224	22 18 48.6	18.40	5 3.22	0.366	15 45.71	1 8.34	7 10 23.33
	11	7 19 32.57	10.207	+22 11 15.3	-19.36	+5 11.83	+0.350	15 45.74	1 8.28	7 14 19.89
	12	7 23 37.33	10.189	22 3 19.2	20.31	5 20.02	0.332	15 45.77	1 8.22	7 18 16.44
	13	7 27 41.65	10.170	21 55 0.3	21.25	5 27.75	0.313	15 45.80	1 8.16	7 22 13.00
	14	7 31 45.49	10.151	21 46 18.9	22.19	5 35.01	0.293	15 45.84	1 8.09	7 26 9.56
	15	7 35 48.85	10.130	21 37 15.2	23.12	5 41.80	0.273	15 45.89	1 8.02	7 30 6.11
	16	7 39 51.71	10.108	+21 27 49.3	-24.03	+5 48.09	+0.251	15 45.95	1 7.95	7 34 2.67
	17	7 43 54.05	10.086	21 18 1.5	24.94	5 53.86	0.229	15 46.00	1 7.88	7 37 59.23
	18	7 47 55.86	10.064	21 7 52.2	25.84	5 59.10	0.207	15 46.07	1 7.81	7 41 55.78
	19	7 51 57.12	10.041	20 57 21.4	26.73	6 3.79	0.184	15 46.14	1 7.73	7 45 52.34
	20	7 55 57.81	10.017	20 46 29.4	27.61	6 7.92	0.160	15 46.22	1 7.65	7 49 48.89
	21	7 59 57.93	9.993	+20 35 16.4	-28.47	+6 11.47	+0.136	15 46.30	1 7.57	7 53 45.45
	22	8 3 57.47	9.969	20 23 42.7	29.33	6 14.44	0.112	15 46.38	1 7.49	7 57 42.00
	23	8 7 56.42	9.944	20 11 48.5	30.18	6 16.83	0.087	15 46.47	1 7.41	8 1 38.56
	24	8 11 54.77	9.919	19 59 34.1	31.02	6 18.63	0.063	15 46.56	1 7.33	8 5 35.12
	25	8 15 52.53	9.894	19 46 59.7	31.85	6 19.83	0.038	15 46.65	1 7.25	8 9 31.67
	26	8 19 49.69	9.869	+19 34 5.5	-32.66	+6 20.43	+0.013	15 46.75	1 7.17	8 13 28.23
	27	8 23 46.25	9.845	19 20 51.9	33.47	6 20.13	-0.012	15 46.85	1 7.08	8 17 24.78
	28	8 27 42.21	9.820	19 7 19.1	34.26	6 19.83	0.037	15 46.95	1 7.00	8 21 21.34
	29	8 31 37.57	9.795	18 53 27.4	35.04	6 18.64	0.062	15 47.05	1 6.91	8 25 17.89
	30	8 35 32.34	9.770	18 39 17.0	35.81	6 16.86	0.086	15 47.16	1 6.82	8 29 14.45
Aug.	31	8 39 26.51	9.745	+18 24 48.1	-36.58	+6 14.48	-0.111	15 47.28	1 6.74	8 33 11.00
	1	8 43 20.08	9.720	18 10 1.1	37.33	6 11.51	0.136	15 47.39	1 6.65	8 37 7.56
	2	8 47 13.07	9.696	17 54 56.2	38.07	6 7.95	0.160	15 47.51	1 6.56	8 41 4.11
	3	8 51 5.47	9.671	17 39 33.8	38.79	6 3.80	0.185	15 47.63	1 6.48	8 45 0.67
	4	8 54 57.28	9.647	17 23 54.1	39.51	5 59.07	0.209	15 47.76	1 6.39	8 48 57.22
	5	8 58 48.50	9.622	+17 7 57.4	-40.21	+5 53.75	-0.234	15 47.89	1 6.30	8 52 53.78
	6	9 2 39.13	9.598	16 51 44.0	40.90	5 47.85	0.258	15 48.02	1 6.21	8 56 50.33
	7	9 6 29.18	9.574	16 35 14.2	41.58	5 41.37	0.282	15 48.16	1 6.13	9 0 46.88
	8	9 10 18.66	9.550	16 18 28.3	42.24	5 34.32	0.306	15 48.30	1 6.04	9 4 43.44
	9	9 14 7.57	9.526	16 1 26.7	42.89	5 26.69	0.330	15 48.44	1 5.96	9 8 39.99
	10	9 17 55.91	9.502	+15 44 9.5	-43.53	+5 18.49	-0.353	15 48.59	1 5.87	9 12 36.55
	11	9 21 43.68	9.478	15 26 37.2	44.15	5 9.73	0.377	15 48.75	1 5.79	9 16 33.10
	12	9 25 30.88	9.455	15 8 50.0	44.76	5 0.40	0.400	15 48.92	1 5.71	9 20 29.66
	13	9 29 17.51	9.431	14 50 48.3	45.36	4 50.51	0.424	15 49.09	1 5.63	9 24 26.21
	14	9 33 3.58	9.408	14 32 32.6	45.94	4 40.05	0.447	15 49.26	1 5.55	9 28 22.76
	15	9 36 49.09	9.385	+14 14 2.9	-46.52	+4 29.04	-0.470	15 49.43	1 5.47	9 32 19.32
	16	9 40 34.06	9.362	+13 55 19.6	-47.08	+4 17.48	-0.493	15 49.61	1 5.39	9 36 15.87

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Aug. 16	9 40 34.06	9.362	+13 55 19.6	-17.08	+ 4 17.48	-0.493	15 49.61	1 5.39	9 36 15.87
17	9 44 18.48	9.339	13 36 23.1	47.62	4 5.38	0.515	15 49.80	1 5.32	9 40 12.42
18	9 48 2.36	9.317	13 17 13.8	48.15	3 52.74	0.537	15 49.99	1 5.24	9 44 8.98
19	9 51 45.71	9.296	12 57 51.9	48.67	3 39.58	0.559	15 50.18	1 5.17	9 48 5.53
20	9 55 28.55	9.275	12 38 17.7	49.17	3 25.91	0.580	15 50.37	1 5.10	9 52 2.08
21	9 59 10.89	9.251	+12 18 31.6	-19.66	+ 3 11.74	-0.600	15 50.57	1 5.03	9 55 58.64
22	10 2 52.74	9.234	11 58 33.9	50.14	2 57.07	0.620	15 50.77	1 4.96	9 59 55.19
23	10 6 34.12	9.215	11 38 24.8	50.61	2 41.93	0.640	15 50.98	1 4.90	10 3 51.74
24	10 10 15.05	9.196	11 18 4.7	51.06	2 26.34	0.659	15 51.18	1 4.83	10 7 48.30
25	10 13 55.54	9.178	10 57 33.9	51.50	2 10.32	0.677	15 51.39	1 4.77	10 11 44.85
26	10 17 35.61	9.161	+10 36 52.7	-51.93	+ 1 53.88	-0.693	15 51.60	1 4.71	10 15 41.40
27	10 21 15.27	9.145	10 16 1.5	52.31	1 37.04	0.709	15 51.81	1 4.65	10 19 37.96
28	10 24 54.55	9.129	9 55 0.4	52.74	1 19.82	0.725	15 52.03	1 4.59	10 23 34.51
29	10 28 33.48	9.115	9 33 49.8	53.13	1 2.24	0.740	15 52.24	1 4.54	10 27 31.06
30	10 32 12.06	9.101	9 12 30.1	53.51	0 44.32	0.751	15 52.46	1 4.49	10 31 27.62
31	10 35 50.30	9.087	+ 8 51 1.4	-53.87	+ 0 26.07	-0.767	15 52.68	1 4.44	10 35 24.17
Sept. 1	10 39 28.24	9.071	8 29 24.2	54.22	+ 0 7.50	0.780	15 52.90	1 4.39	10 39 20.72
2	10 43 5.89	9.063	8 7 38.8	54.56	- 0 11.35	0.791	15 53.12	1 4.35	10 43 17.27
3	10 46 43.26	9.052	7 45 45.5	54.88	0 30.48	0.802	15 53.35	1 4.30	10 47 13.82
4	10 50 20.38	9.042	7 23 44.5	55.19	0 49.86	0.812	15 53.58	1 4.26	10 51 10.38
5	10 53 57.26	9.032	+ 7 1 36.3	-55.49	- 1 9.48	-0.822	15 53.81	1 4.23	10 55 6.93
6	10 57 33.92	9.023	6 39 21.1	55.77	1 29.31	0.831	15 54.04	1 4.19	10 59 3.48
7	11 1 10.38	9.015	6 16 59.3	56.04	1 49.35	0.839	15 54.28	1 4.16	11 3 0.03
8	11 4 46.65	9.008	5 54 31.2	56.29	2 9.58	0.846	15 54.52	1 4.13	11 6 56.59
9	11 8 22.74	9.001	5 31 57.1	56.53	2 29.98	0.853	15 54.76	1 4.11	11 10 53.14
10	11 11 58.68	8.995	+ 5 9 17.5	-56.76	- 2 50.54	-0.859	15 55.00	1 4.09	11 14 49.69
11	11 15 34.47	8.989	4 46 32.6	56.97	3 11.24	0.865	15 55.26	1 4.07	11 18 46.24
12	11 19 10.13	8.983	4 23 42.8	57.17	3 32.08	0.871	15 55.51	1 4.05	11 22 42.79
13	11 22 45.67	8.979	4 0 48.3	57.35	3 53.03	0.875	15 55.77	1 4.04	11 26 39.35
14	11 26 21.11	8.975	3 37 49.7	57.52	4 14.08	0.879	15 56.03	1 4.02	11 30 35.90
15	11 29 56.48	8.972	+ 3 14 47.2	-57.68	- 4 35.21	-0.882	15 56.30	1 4.02	11 34 32.45
16	11 33 31.77	8.970	2 51 41.2	57.82	4 56.41	0.884	15 56.56	1 4.01	11 38 29.00
17	11 37 7.01	8.968	2 28 32.1	57.94	5 17.66	0.886	15 56.83	1 4.01	11 42 25.55
18	11 40 42.24	8.967	2 5 20.1	58.05	5 38.94	0.887	15 57.10	1 4.01	11 46 22.11
19	11 44 17.45	8.967	1 42 5.5	58.15	6 0.22	0.886	15 57.37	1 4.01	11 50 18.66
20	11 47 52.68	8.968	+ 1 18 48.8	-58.23	- 6 21.49	-0.886	15 57.64	1 4.01	11 54 15.21
21	11 51 27.95	8.971	0 55 30.2	58.30	6 42.72	0.881	15 57.91	1 4.02	11 58 11.76
22	11 55 3.27	8.974	0 32 10.0	58.36	7 3.88	0.880	15 58.18	1 4.04	12 2 8.31
23	11 58 38.68	8.978	+ 0 8 48.6	-58.40	7 24.96	0.876	15 58.45	1 4.05	12 6 4.86
24	12 2 14.21	8.983	- 0 14 33.6	58.43	7 45.93	0.871	15 58.72	1 4.07	12 10 1.42
25	12 5 49.87	8.989	- 0 37 56.4	-58.45	- 8 6.76	-0.865	15 58.99	1 4.09	12 13 57.97
26	12 9 25.69	8.996	1 1 19.4	58.46	8 27.44	0.858	15 59.27	1 4.12	12 17 54.52
27	12 13 1.68	9.004	1 24 42.4	58.45	8 47.94	0.850	15 59.54	1 4.15	12 21 51.07
28	12 16 37.88	9.013	1 48 5.0	58.42	9 8.23	0.841	15 59.81	1 4.18	12 25 47.62
29	12 20 14.31	9.023	2 11 26.8	58.38	9 28.30	0.831	16 0.08	1 4.21	12 29 44.18
30	12 23 51.00	9.034	- 2 34 47.4	-58.33	- 9 48.12	-0.820	16 0.35	1 4.25	12 33 40.73
Oct. 1	12 27 27.95	9.046	- 2 58 6.7	-58.26	-10 7.66	-0.808	16 0.62	1 4.29	12 37 37.28

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Oct. 1	12 27 27.95	9.046	2 58 6.7	-53.26	-10 7.66	-0.808	16 0.62	1 4.29	12 37 37.28
2	12 31 5.19	9.059	3 21 24.2	58.18	10 26.92	0.796	16 0.89	1 4.33	12 41 33.83
3	12 34 42.76	9.072	3 44 39.6	58.08	10 45.86	0.782	16 1.16	1 4.37	12 45 30.38
4	12 38 20.66	9.086	4 7 52.4	57.97	11 4.45	0.768	16 1.43	1 4.42	12 49 26.93
5	12 41 58.92	9.102	4 31 2.5	57.85	11 22.69	0.753	16 1.70	1 4.47	12 53 23.48
6	12 45 37.55	9.118	4 54 9.4	-57.71	-11 40.56	-0.736	16 1.97	1 4.53	12 57 20.04
7	12 49 16.57	9.135	5 17 12.7	57.56	11 58.04	0.719	16 2.25	1 4.58	13 1 16.59
8	12 52 56.01	9.152	5 40 12.1	57.39	12 15.11	0.702	16 2.52	1 4.64	13 5 13.14
9	12 56 35.87	9.170	6 3 7.2	57.20	12 31.76	0.684	16 2.80	1 4.71	13 9 9.69
10	13 0 16.18	9.189	6 25 57.6	56.99	12 47.96	0.666	16 3.08	1 4.77	13 13 6.25
11	13 3 56.95	9.208	6 48 42.8	-56.77	-13 3.70	-0.647	16 3.36	1 4.84	13 17 2.80
12	13 7 38.18	9.228	7 11 22.5	56.53	13 18.98	0.627	16 3.64	1 4.91	13 20 59.35
13	13 11 19.89	9.249	7 33 56.4	56.28	13 33.78	0.607	16 3.92	1 4.99	13 24 55.90
14	13 15 2.10	9.270	7 56 24.0	56.01	13 48.08	0.585	16 4.20	1 5.07	13 28 52.46
15	13 18 44.83	9.292	8 18 44.8	55.72	14 1.87	0.563	16 4.48	1 5.15	13 32 49.01
16	13 22 28.09	9.314	8 40 58.6	-55.42	-14 15.12	-0.541	16 4.76	1 5.23	13 36 45.56
17	13 26 11.90	9.337	9 3 5.0	55.10	14 27.83	0.518	16 5.04	1 5.32	13 40 42.11
18	13 29 56.28	9.361	9 25 3.5	54.76	14 39.97	0.494	16 5.32	1 5.40	13 44 38.66
19	13 33 41.24	9.387	9 46 53.7	54.41	14 51.53	0.469	16 5.60	1 5.49	13 48 35.22
20	13 37 26.80	9.412	10 8 35.4	54.04	15 2.49	0.443	16 5.88	1 5.58	13 52 31.77
21	13 41 12.99	9.438	-10 30 8.1	-53.66	-15 12.83	-0.417	16 6.15	1 5.68	13 56 28.32
22	13 44 59.84	9.465	10 51 31.4	53.27	15 22.52	0.390	16 6.42	1 5.77	14 0 24.88
23	13 48 47.34	9.493	11 12 45.0	52.86	15 31.55	0.362	16 6.69	1 5.87	14 4 21.43
24	13 52 35.52	9.522	11 33 48.5	52.43	15 39.90	0.334	16 6.96	1 5.97	14 8 17.98
25	13 56 24.39	9.552	11 54 41.5	51.98	15 47.55	0.304	16 7.23	1 6.07	14 12 14.54
26	14 0 13.98	9.582	-12 15 23.5	-51.52	-15 54.50	-0.274	16 7.49	1 6.18	14 16 11.09
27	14 4 4.31	9.613	12 35 54.3	51.04	16 0.71	0.243	16 7.75	1 6.28	14 20 7.64
28	14 7 55.38	9.641	12 56 13.4	50.54	16 6.17	0.212	16 8.00	1 6.39	14 24 4.20
29	14 11 47.22	9.676	13 16 20.5	50.03	16 10.87	0.180	16 8.25	1 6.50	14 28 0.75
30	14 15 39.84	9.709	13 36 15.1	49.50	16 14.79	0.147	16 8.50	1 6.61	14 31 57.30
31	14 19 33.25	9.742	-13 55 56.9	-48.96	-16 17.92	-0.114	16 8.75	1 6.72	14 35 53.86
Nov. 1	14 23 27.47	9.776	14 15 25.5	48.40	16 20.26	0.081	16 9.00	1 6.83	14 39 50.41
2	14 27 22.49	9.810	14 34 40.4	47.83	16 21.79	0.047	16 9.25	1 6.95	14 43 46.96
3	14 31 18.34	9.844	14 53 41.3	47.24	16 22.49	-0.012	16 9.49	1 7.06	14 47 43.52
4	14 35 15.03	9.879	15 12 27.8	46.63	16 22.36	+0.022	16 9.73	1 7.18	14 51 40.07
5	14 39 12.55	9.914	-15 30 59.3	-46.00	-16 21.39	+0.057	16 9.97	1 7.30	14 55 36.63
6	14 43 10.92	9.949	15 49 15.6	45.35	16 19.58	0.092	16 10.21	1 7.41	14 59 33.18
7	14 47 10.13	9.984	16 7 16.2	44.69	16 16.93	0.128	16 10.44	1 7.53	15 3 29.74
8	14 51 10.19	10.019	16 25 0.7	44.01	16 13.44	0.163	16 10.68	1 7.65	15 7 26.29
9	14 55 11.09	10.054	16 42 28.6	43.31	16 9.11	0.198	16 10.92	1 7.77	15 11 22.84
10	14 59 12.83	10.089	-16 59 39.5	-42.59	-16 3.94	+0.232	16 11.15	1 7.89	15 15 19.40
11	15 3 15.41	10.124	17 16 33.1	41.86	15 57.93	0.267	16 11.38	1 8.01	15 19 15.95
12	15 7 18.83	10.159	17 33 8.8	41.11	15 51.08	0.302	16 11.61	1 8.13	15 23 12.51
13	15 11 23.08	10.194	17 49 26.3	40.34	15 43.40	0.337	16 11.84	1 8.25	15 27 9.06
14	15 15 28.17	10.229	18 5 25.2	39.56	15 34.89	0.371	16 12.07	1 8.37	15 31 5.62
15	15 19 34.08	10.263	-18 21 5.0	-38.75	-15 25.55	+0.406	16 12.29	1 8.49	15 35 2.17
16	15 23 40.83	10.298	-18 36 25.3	-37.93	-15 15.39	+0.440	16 12.51	1 8.61	15 38 58.73

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.18 from the sidereal interval.

FOR WASHINGTON APPARENT NOON.

Date.	Apparent Right Ascension.	Var. per Hour.	Apparent Declination.	Var. per Hour.	Equation of Time. Mean—App.	Var. per Hour.	Semi- diameter.	S. T. of Sem. Pass. Merid.	Sidereal Time of Mean Noon.
	h m s	s	° ' "	"	m s	s	' "	m s	h m s
Nov. 16	15 23 40.83	10.298	-18 36 25.3	-37.93	-15 15.39	+0.440	16 12.51	1 8.61	15 38 58.73
17	15 27 48.40	10.332	18 51 25.9	37.10	15 4.41	0.475	16 12.72	1 8.72	15 42 55.28
18	15 31 56.80	10.367	19 6 6.3	36.25	14 52.60	0.509	16 12.93	1 8.84	15 46 51.84
19	15 36 6.01	10.401	19 20 26.1	35.38	14 39.98	0.543	16 13.14	1 8.95	15 50 48.40
20	15 40 16.03	10.435	19 34 25.0	34.50	14 26.54	0.577	16 13.35	1 9.07	15 54 44.95
21	15 44 26.87	10.468	-19 48 2.6	-33.61	-14 12.29	+0.610	16 13.55	1 9.18	15 58 41.51
22	15 48 38.53	10.502	20 1 18.5	32.70	13 57.24	0.643	16 13.74	1 9.29	16 2 38.06
23	15 52 50.98	10.535	20 14 12.5	31.78	13 41.40	0.677	16 13.93	1 9.40	16 6 34.62
24	15 57 4.21	10.568	20 26 44.0	30.84	13 24.77	0.710	16 14.12	1 9.50	16 10 31.17
25	16 1 18.23	10.600	20 38 52.8	29.88	13 7.36	0.742	16 14.30	1 9.61	16 14 27.73
26	16 5 33.01	10.632	-20 50 38.7	-28.92	-12 49.17	+0.774	16 14.48	1 9.72	16 18 24.29
27	16 9 48.55	10.664	21 2 1.2	27.94	12 30.23	0.805	16 14.65	1 9.82	16 22 20.84
28	16 14 4.85	10.694	21 13 0.0	26.95	12 10.55	0.835	16 14.81	1 9.92	16 26 17.40
29	16 18 21.87	10.724	21 23 34.8	25.94	11 50.14	0.865	16 14.97	1 10.01	16 30 13.96
30	16 22 39.61	10.754	21 33 45.4	24.93	11 29.01	0.895	16 15.12	1 10.11	16 34 10.51
Dec. 1	16 26 58.06	10.783	-21 43 31.3	-23.90	-11 7.18	+0.924	16 15.28	1 10.20	16 38 7.07
2	16 31 17.18	10.811	21 52 52.4	22.86	10 44.68	0.952	16 15.43	1 10.29	16 42 3.62
3	16 35 36.96	10.838	22 1 48.3	21.80	10 21.52	0.979	16 15.58	1 10.37	16 46 0.18
4	16 39 57.38	10.863	22 10 18.8	20.73	9 57.73	1.004	16 15.72	1 10.45	16 49 56.74
5	16 44 18.40	10.888	22 18 23.6	19.66	9 33.33	1.029	16 15.86	1 10.53	16 53 53.30
6	16 48 40.00	10.911	-22 26 2.4	-18.57	- 9 8.35	+1.052	16 15.99	1 10.60	16 57 49.85
7	16 53 2.15	10.933	22 33 14.9	17.47	8 42.82	1.074	16 16.12	1 10.67	17 1 46.41
8	16 57 24.82	10.954	22 40 1.0	16.36	8 16.78	1.095	16 16.25	1 10.74	17 5 42.97
9	17 1 47.97	10.974	22 46 20.5	15.25	7 50.26	1.114	16 16.37	1 10.80	17 9 39.52
10	17 6 11.57	10.992	22 52 13.0	14.12	7 23.29	1.132	16 16.49	1 10.86	17 13 36.08
11	17 10 35.59	11.008	-22 57 38.5	-12.99	- 6 55.90	+1.149	16 16.61	1 10.92	17 17 32.64
12	17 14 59.99	11.024	23 2 36.7	11.85	6 28.14	1.164	16 16.72	1 10.97	17 21 29.19
13	17 19 24.74	11.038	23 7 7.4	10.70	6 0.03	1.178	16 16.83	1 11.02	17 25 25.75
14	17 23 49.81	11.051	23 11 10.5	9.55	5 31.59	1.191	16 16.94	1 11.07	17 29 22.31
15	17 28 15.17	11.062	23 14 45.8	8.39	5 2.87	1.202	16 17.04	1 11.11	17 33 18.87
16	17 32 40.77	11.072	-23 17 53.3	- 7.23	- 4 33.90	+1.212	16 17.14	1 11.14	17 37 15.42
17	17 37 6.60	11.080	23 20 32.8	6.06	4 4.71	1.220	16 17.23	1 11.17	17 41 11.98
18	17 41 32.62	11.087	23 22 44.3	4.89	3 35.32	1.227	16 17.32	1 11.19	17 45 8.54
19	17 45 58.81	11.094	23 24 27.6	3.72	3 5.78	1.234	16 17.39	1 11.21	17 49 5.10
20	17 50 25.12	11.099	23 25 42.7	2.54	2 36.11	1.239	16 17.46	1 11.23	17 53 1.65
21	17 54 51.52	11.102	-23 26 29.6	- 1.37	- 2 6.34	+1.242	16 17.53	1 11.24	17 56 58.21
22	17 59 17.99	11.103	23 26 48.2	- 0.19	1 36.51	1.243	16 17.60	1 11.25	18 0 54.77
23	18 3 44.50	11.104	23 26 38.4	+ 0.99	1 6.65	1.244	16 17.65	1 11.26	18 4 51.33
24	18 8 11.01	11.104	23 26 0.4	2.17	0 36.78	1.244	16 17.70	1 11.26	18 8 47.88
25	18 12 37.49	11.102	23 24 54.0	3.35	- 0 6.94	1.242	16 17.75	1 11.25	18 12 44.44
26	18 17 3.92	11.099	-23 23 19.4	+ 4.53	+ 0 22.85	+1.239	16 17.79	1 11.24	18 16 41.00
27	18 21 30.26	11.095	23 21 16.6	5.70	0 52.55	1.235	16 17.82	1 11.22	18 20 37.56
28	18 25 56.47	11.090	23 18 45.6	6.88	1 22.13	1.230	16 17.84	1 11.20	18 24 34.11
29	18 30 22.54	11.083	23 15 46.5	8.05	1 51.56	1.223	16 17.86	1 11.17	18 28 30.67
30	18 34 48.43	11.074	23 12 19.3	9 21	2 20.81	1.214	16 17.87	1 11.14	18 32 27.23
31	18 39 14.10	11.064	-23 8 24.3	+10.37	+ 2 49.85	+1.205	16 17.88	1 11.11	18 36 23.78

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0.19 from the sidereal interval.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Meri- dian.	Geocen- tric Semi- diameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan. 0	L	22 47.14	2.207	5 28 14.36	142.62	+18 12 47.9	+108.6	67.82	15 29.6	56 46.1	
1	U	11 13.85	2.244	5 56 59.63	144.85	18 26 37.8	+ 28.9	68.35	15 35.0	57 6.2	I. S.
1	L	23 40.95	2.272	6 26 8.59	146.55	18 24 8.8	- 54.3	68.76	15 40.4	57 25.8	
2	U	12 8.34	2.290	6 55 34.41	147.65	18 4 48.0	139.3	69.02	15 45.5	57 44.5	I. II. S.
3	L	0 35.88	2.298	7 25 9.71	148.12	+17 28 25.6	-224.1	69.14	15 50.2	58 2.0	
3	U	13 3.46	2.296	7 54 47.17	148.02	16 35 16.9	306.7	69.13	15 54.5	58 17.9	II. S.
4	L	1 30.96	2.286	8 24 20.18	147.40	15 26 3.2	384.7	69.00	15 58.4	58 32.0	
4	U	13 58.30	2.267	8 53 43.26	146.39	14 148.7	456.5	68.77	16 1.7	58 44.3	II. S.
5	L	2 25.41	2.218	9 22 52.50	145.12	+12 23 58.8	-520.4	68.49	16 4.5	58 54.6	
5	U	14 52.25	2.225	9 51 45.64	143.74	10 34 14.6	575.4	68.18	16 6.8	59 2.8	II. S.
6	L	3 18.81	2.203	10 20 22.18	142.37	8 34 30.0	620.4	67.88	16 8.5	59 9.1	
6	U	15 45.12	2.182	10 48 43.14	141.16	6 26 46.4	655.1	67.61	16 9.7	59 13.5	II. S.
7	L	4 11.21	2.166	11 16 50.91	140.19	+ 4 13 10.5	-679.2	67.40	16 10.4	59 16.1	
7	U	16 37.13	2.156	11 44 48.94	139.54	+ 1 55 50.0	692.5	67.26	16 10.7	59 17.1	II. S.
8	L	5 2.96	2.151	12 12 41.39	139.26	- 0 23 6.8	695.2	67.21	16 10.6	59 16.6	
8	U	17 28.78	2.153	12 40 32.81	139.37	2 41 32.4	687.3	67.25	16 10.1	59 14.8	II. S.
9	L	5 54.65	2.161	13 8 27.91	139.87	- 4 57 21.5	-669.1	67.38	16 9.2	59 11.7	
9	U	18 20.66	2.175	13 36 31.10	140.72	7 8 31.1	640.8	67.59	16 8.1	59 7.5	II. S.
10	L	6 46.87	2.194	14 4 46.30	141.85	9 13 0.8	602.5	67.86	16 6.7	59 2.3	
10	U	19 13.33	2.216	14 33 16.45	143.19	11 8 53.8	554.8	68.17	16 4.9	58 56.0	II. S.
11	L	7 40.07	2.210	15 2 3.41	144.63	-12 54 18.7	-497.9	68.50	16 2.9	58 48.7	
11	U	20 7.09	2.261	15 31 7.55	146.03	14 27 31.1	432.8	68.82	16 0.7	58 40.3	II. S.
12	L	8 34.38	2.284	16 0 27.59	147.26	15 46 57.1	360.4	69.09	15 58.1	58 30.8	
12	U	21 1.89	2.299	16 30 0.61	148.18	16 51 16.5	281.9	69.27	15 55.2	58 20.3	II. S.
13	L	9 29.53	2.307	16 59 41.97	148.64	-17 39 25.8	-199.0	69.35	15 52.0	58 8.6	
13	U	21 57.21	2.305	17 29 25.67	148.55	18 10 42.9	113.5	69.30	15 48.5	57 55.8	II. S.
14	L	10 24.82	2.294	17 59 4.80	147.86	18 24 48.6	- 27.5	69.11	15 44.7	57 41.9	
14	U	22 52.22	2.272	18 28 31.93	146.56	18 21 48.1	+ 57.2	68.77	15 40.7	57 27.0	II. S.
15	L	11 19.31	2.241	18 57 39.89	144.68	-18 2 10.1	+138.4	68.29	15 36.4	57 11.2	
15	U	23 45.97	2.201	19 26 22.18	142.30	17 26 45.4	214.6	67.69	15 31.9	56 54.7	
16	L	12 12.12	2.155	19 54 33.55	139.54	16 36 42.6	284.6	67.00	15 27.2	56 37.6	
17	U	0 37.69	2.105	20 22 10.21	136.53	15 33 23.8	347.2	66.26	15 22.5	56 20.3	
17	L	13 2.64	2.054	20 49 9.96	133.42	-14 18 19.8	+402.1	65.48	15 17.8	56 3.0	
18	U	1 26.97	2.002	21 15 32.25	130.32	12 53 5.9	448.9	64.70	15 13.1	55 45.9	I. S.
18	L	13 50.70	1.953	21 41 17.94	127.33	11 19 17.6	487.8	63.96	15 8.6	55 29.4	
19	U	2 13.85	1.907	22 6 29.14	124.58	9 38 28.0	519.1	63.27	15 4.4	55 13.8	I. S.
19	L	14 36.48	1.866	22 31 9.02	122.12	- 7 52 5.5	+543.4	62.66	15 0.5	54 59.4	
20	U	2 58.66	1.831	22 55 21.49	120.02	6 1 33.0	561.0	62.14	14 57.0	54 46.4	I. S.
20	L	15 20.46	1.803	23 19 11.15	118.33	4 8 7.0	572.4	61.71	14 53.9	54 35.2	
21	U	3 41.96	1.782	23 42 42.97	117.05	2 12 58.1	578.1	61.40	14 51.4	54 26.0	I. S.
21	L	16 3.25	1.768	0 6 2.24	116.23	- 0 17 12.0	+578.6	61.22	14 49.5	54 19.0	
22	U	4 24.42	1.762	0 29 14.46	115.88	+ 1 38 10.4	574.3	61.15	14 48.2	54 14.3	I. S.
22	L	16 45.57	1.764	0 52 25.21	115.99	3 32 10.8	565.1	61.20	14 47.6	54 12.2	
23	U	5 6.79	1.774	1 15 40.13	116.57	5 23 52.6	551.1	61.37	14 47.8	54 12.8	I. S.
23	L	17 28.17	1.791	1 39 4.76	117.61	+ 7 12 19.4	+532.5	61.67	14 48.7	54 16.2	

Jan. 2, U Defective Illumination of I. 0.01.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Jan 24	U	5 49.81	1.816	2 2 44.59	119.10	+ 8 56 34.1	+509.0	62.08	14 50.4	54 22.3	I. S.
24	L	18 11.78	1.848	2 26 44.86	121.01	10 35 36.8	480.4	62.59	14 52.8	54 31.2	I. S.
25	U	6 34.17	1.886	2 51 10.44	123.31	12 8 24.0	446.4	63.19	14 56.0	54 42.9	I. S.
25	L	18 57.06	1.930	3 16 5.79	125.96	13 33 48.3	406.6	63.87	14 59.9	54 57.3	I. S.
26	U	7 20.51	1.978	3 41 34.62	128.88	+14 50 37.6	+360.5	64.61	15 4.5	55 14.2	I. S.
26	L	19 44.56	2.030	4 7 39.79	132.00	15 57 35.5	308.0	65.39	15 9.7	55 33.4	I. S.
27	U	8 9.24	2.084	4 34 23.08	135.22	16 53 22.4	248.7	66.18	15 15.5	55 54.6	I. S.
27	L	20 34.56	2.137	5 14 4.92	138.41	17 36 37.7	182.8	66.95	15 21.8	56 17.5	I. S.
28	U	9 0.51	2.187	5 29 44.20	141.44	+18 6 2.5	+110.5	67.67	15 28.4	56 41.8	I. S.
28	L	21 27.03	2.233	5 58 18.29	144.19	18 20 24.4	+ 32.4	68.31	15 35.2	57 6.9	I. S.
29	U	9 54.06	2.272	6 27 22.98	146.52	18 18 40.9	- 50.3	68.85	15 42.1	57 32.3	I. S.
29	L	22 21.51	2.302	6 56 52.66	148.34	18 0 6.3	135.9	69.27	15 49.0	57 57.5	I. S.
30	U	10 49.27	2.322	7 26 40.78	149.53	+17 24 15.1	-222.6	69.54	15 55.7	58 21.9	I. N.S.
30	L	23 17.21	2.333	7 56 40.29	150.21	16 31 7.5	308.2	69.67	16 1.9	58 44.8	I. N.S.
31	U	11 45.23	2.335	8 26 44.19	150.32	15 21 10.5	390.5	69.68	16 7.6	59 5.7	I. N.S.
Feb. 1	L	0 13.21	2.328	8 56 46.13	119.92	13 55 19.3	467.0	69.58	16 12.6	59 24.1	I. N.S.
1	U	12 41.08	2.315	9 26 40.84	149.14	+12 14 55.9	-535.5	69.40	16 16.8	59 39.6	II. S.
2	L	1 8.76	2.298	9 56 24.52	148.11	10 21 46.0	594.4	69.16	16 20.1	59 51.8	II. S.
2	U	13 36.22	2.279	10 25 54.91	146.95	8 17 53.9	642.3	68.90	16 22.5	60 0.5	II. S.
3	L	2 3.44	2.260	10 55 11.35	145.79	6 5 38.3	678.2	68.64	16 24.0	60 5.7	II. S.
3	U	14 30.45	2.212	11 24 14.54	144.76	+ 3 47 26.7	-701.6	68.41	16 24.4	60 7.3	II. S.
4	L	2 57.27	2.228	11 53 6.34	143.92	+ 1 25 50.1	712.4	68.24	16 23.9	60 5.5	II. S.
4	U	15 23.95	2.218	12 21 49.50	143.32	- 0 56 40.3	710.6	68.12	16 22.6	60 0.6	II. S.
5	L	3 50.53	2.213	12 50 27.22	143.01	3 17 37.9	697.0	68.07	16 20.5	59 53.0	II. S.
5	U	16 17.08	2.213	13 19 2.94	142.99	- 5 34 41.5	-671.8	68.09	16 17.8	59 43.0	II. S.
6	L	4 43.66	2.217	13 47 39.97	143.22	7 45 38.6	636.0	68.17	16 14.5	59 31.1	II. S.
6	U	17 10.30	2.224	14 16 21.10	143.66	9 48 26.3	590.4	68.30	16 10.8	59 17.6	II. S.
7	L	5 37.04	2.234	14 45 8.48	141.25	11 41 12.0	535.9	68.45	16 6.8	59 3.0	II. S.
7	U	18 3.91	2.244	15 14 3.27	144.88	-13 22 15.1	-473.4	68.61	16 2.6	58 47.5	II. S.
8	L	6 30.90	2.254	15 43 5.53	145.47	14 50 7.9	404.3	68.76	15 58.3	58 31.5	II. S.
8	U	18 58.00	2.261	16 12 14.05	145.91	16 3 37.0	329.7	68.85	15 53.8	58 15.2	II. S.
9	L	7 25.16	2.264	16 41 26.39	146.10	17 14 4.2	250.9	68.87	15 49.3	57 58.8	II. S.
9	U	19 52.32	2.262	17 10 39.03	145.95	-17 43 48.5	-169.5	68.81	15 44.9	57 42.5	II. S.
10	L	8 19.42	2.253	17 39 47.47	145.39	18 9 27.4	87.0	68.65	15 40.5	57 26.3	II. S.
10	U	20 46.36	2.236	18 8 46.68	144.40	18 18 36.8	- 4.8	68.37	15 36.1	57 10.3	II. S.
11	L	9 13.06	2.213	18 37 31.41	142.98	18 11 31.9	+ 75.2	67.99	15 31.8	56 54.6	II. S.
11	U	21 39.44	2.182	19 5 56.61	141.16	-17 48 45.1	+151.9	67.50	15 27.6	56 39.1	II. N.
12	L	10 5.42	2.146	19 33 57.80	138.99	17 11 5.2	223.9	66.93	15 23.5	56 23.9	II. N.
12	U	22 30.94	2.106	20 1 31.36	136.56	16 19 34.5	290.2	66.29	15 19.4	56 9.0	II. N.
13	L	10 55.95	2.063	20 28 34.75	133.98	15 15 25.8	350.1	65.62	15 15.5	55 54.5	II. N.
13	U	23 20.44	2.019	20 55 6.59	131.32	-13 59 59.8	+403.1	64.92	15 11.6	55 40.3	II. N.
14	L	11 44.41	1.975	21 21 6.60	128.69	12 34 41.6	448.8	64.23	15 7.9	55 26.6	II. N.
15	U	0 7.86	1.933	21 46 35.60	126.16	11 0 57.9	487.2	63.57	15 4.3	55 13.5	II. N.
15	L	12 30.82	1.894	22 11 35.35	123.82	9 20 15.8	518.5	62.96	15 0.9	55 1.1	II. N.
16	U	0 53.33	1.860	22 36 8.41	121.73	- 7 34 0.0	+543.0	62.41	14 57.7	54 49.4	II. N.

Jan. 30, U Defective Illumination of N. 0° 31.

Jan. 31, U Defective Illumination of N. 0° 76.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Feb. 16	U	0 53.33	1.860	22 36 8.41	121.73	- 7 34 0.0	+543.0	62.41	14 57.7	54 49.4	
16	L	13 15.46	1.830	23 0 18.01	119.92	5 43 32.1	580.6	61.94	14 54.8	54 38.7	
17	U	1 37.26	1.805	23 24 7.84	118.44	3 50 9.9	572.0	61.57	14 52.2	54 29.2	I. S.
17	L	13 58.80	1.786	23 47 42.03	117.33	- 1 55 7.2	577.4	61.30	14 50.0	54 21.0	
18	U	2 20.15	1.774	0 11 4.93	116.57	+ 0 0 26.6	+577.3	61.13	14 48.2	54 14.3	I. S.
18	L	14 41.39	1.768	0 34 21.14	116.21	1 55 25.7	571.7	61.06	14 46.8	54 9.3	
19	U	3 2.60	1.768	0 57 35.36	116.24	3 48 47.1	561.0	61.11	14 46.0	54 6.1	I. S.
19	L	15 23.86	1.775	1 20 52.31	116.66	5 39 30.8	545.4	61.26	14 45.7	54 5.0	
20	U	3 45.23	1.789	1 44 16.77	117.48	+ 7 26 37.6	+524.9	61.51	14 46.0	54 6.2	I. S.
20	L	16 6.81	1.809	2 7 53.38	118.69	9 9 9.0	499.6	61.86	14 46.9	54 9.7	
21	U	4 28.67	1.835	2 31 46.67	120.26	10 46 6.3	469.2	62.31	14 48.6	54 15.8	I. S.
21	L	16 50.88	1.867	2 56 0.92	122.17	12 16 29.3	433.8	62.85	14 51.0	54 24.5	
22	U	5 13.50	1.904	3 20 40.08	124.40	+13 39 16.0	+393.1	63.46	14 54.1	54 35.8	I. S.
22	L	17 36.59	1.945	3 45 47.61	126.89	14 53 21.9	347.0	64.12	14 57.9	54 49.8	
23	U	6 0.20	1.990	4 11 26.35	129.60	15 57 40.3	295.1	64.82	15 2.4	55 6.5	I. S.
23	L	18 24.36	2.037	4 37 38.39	132.43	16 51 2.3	237.5	65.55	15 7.7	55 25.8	
24	U	6 49.09	2.085	5 4 24.83	135.31	+17 32 18.2	+174.2	66.28	15 13.6	55 47.6	I. S.
24	L	19 14.40	2.132	5 31 45.73	138.15	18 0 19.5	105.1	66.98	15 20.1	56 11.6	
25	U	7 40.26	2.177	5 59 39.99	140.86	18 14 0.7	+ 30.9	67.63	15 27.2	56 37.6	I. N.S.
25	L	20 6.64	2.218	6 28 5.31	143.31	18 12 23.4	- 47.8	68.21	15 34.7	57 5.1	
26	U	8 33.48	2.254	6 56 58.27	145.45	+17 54 40.1	-129.9	68.70	15 42.5	57 33.7	I. N.S.
26	L	21 0.71	2.283	7 26 14.57	147.19	17 20 18.0	213.9	69.09	15 50.5	58 2.9	
27	U	9 28.24	2.305	7 55 49.28	148.52	16 29 3.5	298.2	69.38	15 58.4	58 32.0	I. N.
27	L	21 55.99	2.320	8 25 37.22	149.41	15 21 5.9	380.8	69.56	16 6.1	59 0.3	
28	U	10 23.88	2.328	8 55 33.36	149.89	+13 56 59.9	-459.3	69.65	16 13.4	59 27.1	I. N.
28	L	22 51.83	2.330	9 25 33.23	150.03	12 17 46.8	531.6	69.66	16 20.1	59 51.6	
Mar. 1	U	11 19.78	2.328	9 55 33.16	149.92	10 24 54.9	595.4	69.61	16 26.0	60 13.1	I. N.S.
1	L	23 47.69	2.323	10 25 30.63	149.63	8 20 17.1	648.9	69.53	16 30.8	60 30.9	
2	U	12 15.53	2.317	10 55 24.12	149.27	+ 6 6 8.5	-690.3	69.44	16 34.5	60 44.5	I. II. N.S.
3	L	0 43.30	2.312	11 25 13.24	148.92	3 45 ' 0.9	718.5	69.36	16 37.0	60 53.5	
3	U	13 11.01	2.307	11 54 58.47	148.64	+ 1 19 39.2	732.7	69.30	16 38.1	60 57.7	II. S.
4	L	1 38.67	2.304	12 24 40.98	148.47	- 1 7 6.1	732.4	69.28	16 37.9	60 57.0	
4	U	14 6.31	2.303	12 54 22.29	148.44	- 3 32 23.1	-718.0	69.30	16 36.4	60 51.7	II. S.
5	L	2 33.96	2.305	13 24 4.03	148.54	5 53 24.7	690.0	69.35	16 33.8	60 42.0	
5	U	15 1.64	2.308	13 53 47.52	148.72	8 7 33.1	649.4	69.43	16 30.1	60 28.4	II. S.
6	L	3 29.36	2.312	14 23 33.61	148.96	10 12 23.8	597.3	69.52	16 25.5	60 11.5	
6	U	15 57.13	2.315	14 53 22.39	149.16	-12 5 49.4	-535.4	69.60	16 20.2	59 52.0	II. S.
7	L	4 24.93	2.317	15 23 13.03	149.25	13 46 1.6	465.4	69.65	16 14.4	59 30.5	
7	U	16 52.72	2.315	15 53 3.68	149.15	15 11 33.1	388.9	69.65	16 8.1	59 7.6	II. S.
8	L	5 20.47	2.309	16 22 51.56	148.78	16 21 18.0	308.0	69.57	16 1.6	58 43.9	
8	U	17 48.12	2.297	16 52 33.07	148.08	-17 14 33.4	-224.3	69.41	15 55.1	58 19.9	II. S.
9	L	6 15.59	2.286	17 22 3.98	147.01	17 50 57.5	139.7	69.15	15 48.6	57 56.2	
9	U	18 42.80	2.256	17 51 19.81	145.57	18 10 29.6	- 55.9	68.79	15 42.3	57 33.0	II. S.
10	L	7 9.70	2.226	18 20 16.08	143.76	18 13 27.8	+ 25.7	68.33	15 36.2	57 10.6	
10	U	19 36.20	2.190	18 48 48.69	141.63	-18 0 26.8	+103.8	67.78	15 30.4	56 49.2	II. N.

Feb. 25, U Defective Illumination of N. 0°.64.
 Feb. 26, U Defective Illumination of S. 0°.26.
 Mar. 1, U Defective Illumination of S. 0°.49.

Mar. 2, U Defective Illumination of I. 0°.00.
 Mar. 2, U Defective Illumination of N. 0°.29.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Mar. 10	U	19 36.20	2.190	18 48 48.69	141.63	-18 0 26.8	+103.8	67.78	15 30.4	56 49.2	II. N.
11	L	8 2.25	2.151	19 16 54.16	139.25	17 32 15.5	177.3	67.17	15 24.9	56 29.1	
11	U	20 27.80	2.108	19 44 29.92	136.69	16 49 53.9	245.4	66.50	15 19.8	56 10.2	II. N.
12	L	8 52.83	2.064	20 11 34.32	134.03	15 54 30.3	307.5	65.79	15 15.0	55 52.7	
12	U	21 17.33	2.020	20 38 6.71	131.37	-14 47 18.9	+363.2	65.08	15 10.6	55 36.5	II. N.
13	L	9 41.31	1.976	21 4 7.44	128.77	13 29 37.8	412.5	64.37	15 6.5	55 21.6	
13	U	22 4.78	1.935	21 29 37.72	126.30	12 2 46.3	455.0	63.70	15 2.8	55 7.9	II. N.
14	L	10 27.78	1.898	21 54 39.50	124.03	10 28 4.3	490.8	63.08	14 59.4	54 55.4	
14	U	22 50.34	1.864	22 19 15.37	121.99	-8 46 50.8	+520.3	62.52	14 56.3	54 44.2	II. N.
15	L	11 12.53	1.835	22 43 28.44	120.24	7 0 23.3	543.3	62.03	14 53.6	54 34.2	
15	U	23 34.39	1.810	23 7 22.14	118.77	5 9 57.1	560.0	61.62	14 51.2	54 25.3	
16	L	11 55.99	1.791	23 31 0.22	117.63	3 16 45.9	570.8	61.31	14 49.1	54 17.6	
17	U	0 17.40	1.778	23 54 26.61	116.83	-1 22 0.7	+575.8	61.09	14 47.3	54 11.1	
17	L	12 38.69	1.770	0 17 45.33	116.36	+0 33 9.6	575.0	60.97	14 45.9	54 5.9	
18	U	0 59.91	1.768	0 41 0.46	116.23	2 27 37.7	568.8	60.95	14 44.8	54 2.0	
18	L	13 21.14	1.771	1 4 16.04	116.43	4 20 18.4	557.1	61.03	14 44.2	53 59.5	
19	U	1 42.44	1.780	1 27 36.12	116.98	+6 10 7.8	+540.3	61.20	14 43.9	53 58.5	I. S.
19	L	14 3.89	1.795	1 51 4.62	117.83	7 56 2.9	518.1	61.45	14 44.0	53 59.1	
20	U	2 25.54	1.814	2 14 45.24	118.99	9 37 2.0	490.8	61.79	14 44.7	54 1.4	I. S.
20	L	14 47.44	1.838	2 38 41.51	120.43	11 12 2.8	458.4	62.21	14 45.8	54 5.6	
21	U	3 9.66	1.866	3 2 56.69	122.13	+12 40 3.9	+420.8	62.70	14 47.5	54 11.9	I. S.
21	L	15 32.24	1.898	3 27 33.60	124.06	14 0 3.7	378.2	63.24	14 49.8	54 20.3	
22	U	3 55.23	1.933	3 52 34.66	126.15	15 11 0.5	330.3	63.83	14 52.7	54 30.9	I. S.
22	L	16 18.64	1.970	4 18 1.76	128.38	16 11 52.9	277.5	64.44	14 56.3	54 43.9	
23	U	4 42.51	2.008	4 43 56.10	130.69	+17 14 0.1	+219.5	65.06	15 0.5	54 59.3	I. S.
23	L	17 6.84	2.047	5 10 18.25	133.00	17 39 22.9	156.8	65.68	15 5.3	55 17.0	
24	U	5 31.63	2.085	5 37 8.02	135.28	18 4 5.0	89.5	66.27	15 10.8	55 37.2	I. S.
24	L	17 56.87	2.121	6 4 24.44	137.44	18 14 54.0	+18.1	66.82	15 16.9	55 59.7	
25	U	6 22.52	2.154	6 32 5.88	139.44	+18 11 4.8	-56.8	67.32	15 23.6	56 24.3	I. N.
25	L	18 48.54	2.183	7 0 10.06	141.22	17 52 0.1	134.4	67.76	15 30.8	56 50.9	
26	U	7 14.90	2.209	7 28 34.30	142.77	17 17 14.3	213.4	68.12	15 38.5	57 19.1	I. N.
26	L	19 41.55	2.231	7 57 15.63	144.07	16 26 35.7	202.9	68.42	15 46.5	57 48.5	
27	U	8 8.43	2.249	8 26 11.12	145.14	+15 20 9.0	-371.2	68.66	15 54.7	58 18.6	I. N.
27	L	20 35.50	2.263	8 55 18.04	145.99	13 58 17.3	446.7	68.84	16 3.0	58 48.9	
28	U	9 2.72	2.274	9 24 34.11	146.67	12 21 45.3	517.7	68.98	16 11.1	59 18.6	I. N.
28	L	21 30.07	2.284	9 53 57.72	147.24	10 31 39.1	582.1	69.08	16 18.8	59 46.9	
29	U	9 57.53	2.293	10 23 27.96	147.78	+8 29 28.4	-638.1	69.18	16 25.9	60 13.0	I. N.
29	L	22 25.09	2.302	10 53 4.59	148.32	6 17 4.8	683.9	69.29	16 32.2	60 36.1	
30	U	10 52.77	2.312	11 22 48.10	148.94	3 56 42.0	717.7	69.41	16 37.5	60 55.5	I. N.
30	L	23 20.58	2.323	11 52 39.48	149.64	+1 30 52.6	738.1	69.57	16 41.6	61 10.4	
31	U	11 48.54	2.337	12 22 39.93	150.45	-0 57 35.4	-744.0	69.76	16 44.3	61 20.3	I. N.S.
Apr. 1	U	0 16.67	2.352	12 52 50.72	151.36	3 25 43.3	734.7	69.98	16 45.5	61 24.8	
1	L	12 44.99	2.368	13 23 12.76	152.32	5 50 28.0	710.2	70.21	16 45.2	61 23.8	II. N.S.
2	L	1 13.50	2.384	13 53 46.33	153.26	8 8 48.0	670.8	70.45	16 43.4	61 17.3	
2	U	13 42.19	2.398	14 24 30.73	154.11	-10 17 51.5	-617.5	70.68	16 40.3	61 5.7	II. S.

Mar. 31, U Defective Illumination of S. 0''.77.

Apr. 1, U Defective Illumination of N. 0''.41.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	" "	" "	
Apr. 2	U	13 42.19	2.398	14 24 30.73	154.11	-10 17 51.5	-617.5	70.68	16 40.3	61 5.7	II. S.
3	L	2 11.03	2.408	14 55 24.12	154.75	12 15 1.9	552.2	70.85	16 35.8	60 49.4	
3	U	14 39.96	2.413	15 26 23.34	155.07	13 58 4.9	476.7	70.96	16 30.3	60 29.1	II. S.
4	L	3 8.92	2.412	15 57 23.93	154.96	15 25 12.5	393.5	70.97	16 23.9	60 5.6	
4	U	15 37.81	2.402	16 28 20.39	154.36	-16 35 7.4	-305.1	70.86	16 16.8	59 39.6	II. S.
5	L	4 6.53	2.383	16 59 6.40	153.22	17 27 2.7	211.0	70.62	16 9.3	59 11.9	
5	U	16 34.96	2.355	17 29 35.36	151.52	18 0 42.5	122.8	70.24	16 1.5	58 43.3	II. N.S.
6	L	5 3.01	2.318	17 59 40.87	149.31	18 16 18.5	-33.7	69.72	15 53.6	58 14.4	
6	U	17 30.57	2.274	18 29 17.21	146.67	-18 14 27.0	+51.5	69.09	15 45.8	57 45.9	II. N.
7	L	5 57.56	2.225	18 58 19.73	143.69	17 56 3.1	131.5	68.37	15 38.3	57 18.3	
7	U	18 23.94	2.172	19 26 45.07	140.50	17 22 16.2	205.2	67.58	15 31.1	56 51.9	II. N.
8	L	6 49.67	2.117	19 54 31.33	137.21	16 34 24.7	272.1	66.75	15 24.4	56 27.1	
8	U	19 14.74	2.062	20 21 38.00	133.92	-15 33 52.8	+332.0	65.90	15 18.1	56 4.1	II. N.
9	L	7 39.17	2.009	20 48 5.85	130.75	14 22 5.4	381.7	65.07	15 12.4	55 43.0	
9	U	20 2.98	1.960	21 13 56.75	127.77	13 0 27.7	430.4	64.27	15 7.2	55 24.0	II. N.
10	L	8 26.23	1.915	21 39 13.45	125.06	11 30 22.0	469.4	63.54	15 2.6	55 7.0	
10	U	20 48.96	1.875	22 3 59.37	122.65	-9 53 7.4	+501.9	62.87	14 58.5	54 52.0	II. N.
11	L	9 11.24	1.840	22 28 18.44	120.58	8 10 0.2	528.2	62.29	14 54.9	54 38.9	
11	U	21 33.15	1.812	22 52 14.90	118.89	6 22 13.1	548.6	61.80	14 51.9	54 27.8	II. N.
12	L	9 54.76	1.790	23 15 53.20	117.56	4 30 56.2	563.3	61.41	14 49.3	54 18.5	
12	U	22 16.14	1.774	23 39 17.84	116.61	-2 37 17.2	+572.4	61.13	14 47.3	54 10.9	II. N.
13	L	10 37.37	1.765	0 2 33.34	116.04	-0 42 22.2	576.0	60.95	14 45.7	54 5.0	
13	U	22 58.52	1.761	0 25 44.15	115.83	+1 12 43.7	574.1	60.88	14 44.5	54 0.6	II. N.
14	L	11 19.67	1.761	0 48 51.61	115.97	3 6 56.0	567.0	60.90	14 43.7	53 57.7	
14	U	23 30.87	1.772	1 12 8.88	116.45	+4 59 10.4	+551.5	61.02	14 43.3	53 56.3	
15	L	12 2.21	1.785	1 35 30.87	117.26	6 48 22.4	536.6	61.23	14 43.2	53 56.2	
16	U	0 23.74	1.803	1 59 4.22	118.35	8 33 27.1	513.3	61.53	14 43.6	53 57.6	
16	L	12 45.51	1.826	2 22 52.27	119.70	10 13 19.0	484.5	61.90	14 44.4	54 0.4	
17	U	1 7.57	1.852	2 46 57.91	121.28	+11 46 52.7	+450.2	62.33	14 45.5	54 4.6	I. S.
17	L	13 29.96	1.881	3 11 23.56	123.03	13 13 2.8	410.5	62.82	14 47.1	54 10.2	
18	U	1 52.72	1.912	3 36 11.13	121.91	14 30 44.2	365.4	63.34	14 49.0	54 17.4	I. S.
18	L	14 15.87	1.915	4 1 21.87	126.88	15 38 53.2	315.2	63.89	14 51.4	54 26.2	
19	U	2 39.41	1.978	4 26 56.43	128.87	+16 36 28.5	+259.9	64.44	14 54.3	54 36.6	I. S.
19	L	15 3.34	2.011	4 52 54.72	130.83	17 22 31.5	199.9	64.98	14 57.6	54 48.8	
20	U	3 27.66	2.042	5 19 15.98	132.70	17 56 8.4	135.6	65.49	15 1.4	55 2.8	I. N.
20	L	15 52.33	2.070	5 45 58.81	134.41	18 16 31.2	+67.6	65.96	15 5.7	55 18.7	
21	U	4 17.34	2.096	6 13 1.29	135.96	+18 22 58.9	-3.5	66.39	15 10.6	55 36.5	I. N.
21	L	16 42.62	2.118	6 40 21.06	137.30	18 14 59.3	76.8	66.75	15 15.9	55 56.1	
22	U	5 8.16	2.137	7 7 55.60	138.42	17 52 10.2	151.5	67.05	15 21.8	56 17.6	I. N.
22	L	17 33.90	2.152	7 35 42.32	139.33	17 14 20.0	226.7	67.29	15 28.1	56 40.8	
23	U	5 59.80	2.164	8 3 38.90	140.07	+16 21 30.2	-301.4	67.48	15 34.9	57 5.7	I. N.
23	L	18 25.83	2.174	8 31 43.43	140.67	15 13 54.5	374.2	67.63	15 42.0	57 31.9	
24	U	6 51.97	2.183	8 59 54.62	141.19	13 52 1.2	444.0	67.75	15 49.4	57 59.1	I. N.
24	L	19 18.22	2.191	9 28 11.89	141.70	12 16 33.2	509.8	67.87	15 57.0	58 26.9	
25	U	7 44.57	2.201	9 56 35.47	142.25	+10 28 29.0	-569.9	67.98	16 4.6	58 54.8	I. N.

Apr. 5, U Defective Illumination of N. 0°.14.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Apr. 25	U	7 44.57	2.201	9 56 35.47	142.25	+10 28 29.0	-569.9	67.98	16 4.6	58 54.8	I. N.
25	L	20 11.04	2.212	10 25 6.42	142.93	8 29 3.9	623.0	68.13	16 12.1	59 22.2	
26	U	8 37.66	2.226	10 53 46.46	143.77	6 19 49.9	667.7	68.31	16 19.3	59 48.5	I. N.
26	L	21 4.48	2.244	11 22 38.00	144.85	4 2 37.5	702.5	68.54	16 25.9	60 12.8	
27	U	9 31.53	2.266	11 51 43.82	146.16	+ 1 39 34.3	-725.9	68.83	16 31.8	60 34.5	I. N.
27	L	21 58.87	2.291	12 21 6.83	147.72	- 0 46 54.0	736.6	69.18	16 36.8	60 52.8	
28	U	10 26.54	2.321	12 50 49.81	149.48	3 14 6.8	733.2	69.59	16 40.6	61 7.0	I. N.
28	L	22 54.57	2.352	13 20 54.99	151.40	5 39 11.0	715.0	70.03	16 43.2	61 16.5	
29	U	11 23.00	2.385	13 51 23.66	153.37	- 7 59 6.3	-681.6	70.49	16 44.4	61 20.8	I. N.
29	L	23 51.82	2.417	14 22 15.76	155.28	10 10 50.9	633.3	70.94	16 44.1	61 19.8	
30	U	12 21.00	2.445	14 53 29.54	156.96	12 11 29.7	570.9	71.35	16 42.4	61 13.3	II. N.S.
May 1	L	0 50.48	2.466	15 25 1.32	158.25	13 58 22.9	496.0	71.66	16 39.2	61 1.7	
1	U	13 20.16	2.479	15 56 45.39	158.98	-15 29 13.5	-410.9	71.85	16 34.7	60 45.3	II. N.S.
2	L	14 9.92	2.480	16 28 34.24	159.03	16 42 16.0	318.5	71.89	16 29.1	60 24.7	
2	U	14 19.61	2.467	17 0 19.03	158.30	17 36 20.7	221.8	71.74	16 22.5	60 0.5	II. N.S.
3	L	2 49.08	2.442	17 31 50.21	156.77	18 10 55.5	121.1	71.41	16 15.2	59 33.7	
3	U	15 18.17	2.404	18 2 58.35	154.47	-18 26 6.0	- 28.3	70.90	16 7.4	59 5.0	II. N.
4	L	3 46.73	2.355	18 33 34.91	151.52	18 22 30.4	+ 63 2	70.22	15 59.3	58 35.1	
4	U	16 14.65	2.297	19 3 32.87	148.07	18 1 13.8	148 3	69.41	15 51.0	58 4.9	II. N.
5	L	4 41.84	2.234	19 32 47.20	144.28	17 23 40.8	225.8	68.51	15 42.9	57 35.1	
5	U	17 8.26	2.169	20 1 14.94	140.33	-16 31 27.5	+295.0	67.55	15 35.0	57 6.2	II. N.
6	L	5 33.89	2.103	20 28 55.19	136.39	15 26 15.9	355.5	66.58	15 27.5	56 38.6	
6	U	17 58.74	2.040	20 55 48.87	132.58	14 9 47.8	407.7	65.62	15 20.5	56 12.7	II. N.
7	L	6 22.86	1.981	21 21 58.38	129.04	12 43 41.8	451.9	64.71	15 14.0	55 49.0	
7	U	18 46.31	1.928	21 47 27.29	125.84	-11 9 30.9	+488.6	63.86	15 8.1	55 27.4	II. N.
8	L	7 9.15	1.881	22 12 20.02	123.02	9 28 41.7	518.4	63.11	15 2.9	55 8.2	
8	U	19 31.48	1.841	22 36 41.54	120.63	7 42 33.9	541 9	62.46	14 58.3	54 51.4	II. N.
9	L	7 53.38	1.809	23 0 37.16	118.71	5 52 21.1	559.3	61.92	14 54.4	54 37.1	
9	U	20 14.93	1.785	23 24 12.37	117.24	- 3 59 12.6	+571.2	61.50	14 51.2	54 25.2	II. N.
10	L	8 36.24	1.768	23 47 32.64	116.22	2 4 13.1	577.8	61.19	14 48.6	54 15.7	
10	U	20 57.39	1.758	0 10 43.40	115.65	- 0 8 24.9	579.4	61.00	14 46.6	54 8.4	II. N.
11	L	9 18.47	1.756	0 33 49.95	115.51	+ 1 47 11.3	575.9	60.93	14 45.2	54 3.3	
11	U	21 39.56	1.761	0 56 57.35	115.79	+ 3 41 34.9	+567.3	60.97	14 44.3	54 0.2	II. N.
12	L	10 0.75	1.772	1 20 10.38	116.45	5 33 44.8	553.5	61.13	14 44.0	53 59.1	
12	U	22 22.11	1.789	1 43 33.50	117.47	7 22 38.9	534.5	61.38	14 44.2	53 59.7	II. N.
13	L	10 43.70	1.811	2 7 10.77	118.80	9 7 13.4	510.2	61.72	14 44.8	54 2.0	
13	U	23 5.58	1.838	2 31 5.76	120.41	+10 46 22.2	+480.3	62.13	14 45.9	54 5.9	
14	L	11 27.81	1.868	2 55 21.43	122.24	12 18 58.1	441.7	62.60	14 47.3	54 11.2	
14	U	23 50.43	1.901	3 20 0.12	124.23	13 43 52.4	403.3	63.12	14 49.1	54 17.8	
15	L	12 13.45	1.936	3 45 3.39	126.32	14 59 56.0	356.3	63.67	14 51.3	54 25.6	
16	U	0 36.89	1.971	4 10 31.90	128.43	+16 6 1.1	+303.7	64.22	14 53.7	54 34.7	
16	L	13 0.74	2.005	4 36 25.47	130.48	17 1 2.3	245.7	64.77	14 56.5	54 44.9	
17	U	1 24.99	2.037	5 2 42.96	132.40	17 43 58.8	182.9	65.28	14 59.6	54 56.3	I. N.
17	L	13 49.61	2.066	5 29 22.36	134.12	18 13 56.0	116.0	65.74	15 3.0	55 8.8	
18	U	2 14.55	2.090	5 56 20.91	135.50	+18 30 8.6	+ 45.6	66.14	15 6.7	55 22.4	I. N.

Apr. 30, U Defective Illumination of S. 0° 37.

May 2, U Defective Illumination of S. 0° 00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	"	' "	' "	
May 18	U	2 14.55	2.090	5 56 20.91	135.59	+18 30 8.6	+ 45.6	66.14	15 6.7	55 22.4	I. N.
18	L	14 39.75	2.109	6 23 35.26	136.75	18 32 0.5	- 27.3	66.47	15 10.7	55 37.1	
19	U	3 5.15	2.123	6 51 1.73	137.60	18 19 8.4	101.6	66.72	15 15.1	55 53.0	I. N.
19	L	15 30.69	2.132	7 18 36.63	138.16	17 51 21.9	176.1	66.89	15 19.7	56 10.0	
20	U	3 56.31	2.137	7 46 16.48	138.44	+17 8 43.8	-219.9	66.99	15 24.6	56 28.1	I. N.
20	L	16 21.97	2.138	8 13 58.40	138.52	16 11 30.3	321.8	67.04	15 29.9	56 47.3	
21	U	4 47.63	2.137	8 41 40.29	138.45	15 0 10.9	390.8	67.04	15 35.4	57 7.5	I. N.
21	L	17 13.26	2.135	9 9 20.99	138.33	13 35 27.5	455.6	67.03	15 41.1	57 28.6	
22	U	5 38.88	2.134	9 37 0.42	138.25	+11 58 13.8	-515.7	67.03	15 47.1	57 50.5	I. N.
22	L	18 4.49	2.135	10 4 39.56	138.30	10 9 35.2	569.7	67.04	15 53.2	58 12.8	
23	U	6 30.13	2.139	10 32 20.44	138.55	8 10 47.8	616.9	67.10	15 59.3	58 35.4	I. N.
23	L	18 55.85	2.148	11 0 5.95	139.09	6 3 19.8	656.3	67.22	16 5.4	58 57.8	
24	U	7 21.70	2.162	11 27 59.78	139.95	+ 3 48 50.2	-686.9	67.42	16 11.4	59 19.6	I. N.
24	L	19 47.76	2.183	11 56 6.10	141.17	+ 1 29 11.1	707.7	67.71	16 17.0	59 40.2	
25	U	8 14.11	2.209	12 24 29.41	142.77	- 0 53 33.1	717.6	68.08	16 22.2	59 59.2	I. N.
25	L	20 40.81	2.242	12 53 14.10	144.73	3 17 5.5	715.6	68.53	16 26.7	60 15.9	
26	U	9 7.93	2.280	13 22 24.22	147.01	- 5 38 56.2	-700.6	69.06	16 30.5	60 29.8	I. N.
26	L	21 35.53	2.321	13 52 2.93	149.19	7 56 26.0	672.0	69.64	16 33.4	60 40.3	
27	U	10 3.64	2.364	14 22 12.12	152.06	10 6 48.7	629.4	70.24	16 35.2	60 46.9	I. N.
27	L	22 32.25	2.405	14 52 51.96	154.56	12 7 16.4	573.0	70.81	16 35.8	60 49.2	
28	U	11 1.34	2.442	15 24 0.41	156.79	-13 55 7.5	-503.4	71.33	16 35.2	60 47.0	I. N.
28	L	23 30.83	2.472	15 55 33.07	158.55	15 27 53.4	422.4	71.73	16 33.3	60 40.2	
29	U	12 0.61	2.490	16 27 23.02	159.65	16 43 28.8	332.1	71.98	16 30.2	60 28.9	I. II. N.
30	L	0 30.53	2.494	16 59 21.20	159.90	17 40 19.3	235.4	72.05	16 26.0	60 13.4	
30	U	13 0.41	2.483	17 31 17.05	159.21	-18 17 27.3	-135.7	71.91	16 20.8	59 54.2	II. N.
31	L	1 30.06	2.456	18 2 59.26	157.63	18 34 35.7	- 36.1	71.55	16 14.7	59 31.8	
31	U	13 59.30	2.415	18 34 16.86	155.16	18 32 5.7	+ 60.2	70.99	16 7.9	59 6.9	II. N.
June 1	L	2 27.97	2.362	19 5 0.15	151.95	18 10 53.6	150.6	70.25	16 0.6	58 40.1	
1	U	14 55.95	2.299	19 35 1.51	148.20	-17 32 22.6	+233.1	69.37	15 53.0	58 12.2	II. N.
2	L	3 23.14	2.231	20 4 15.62	144.12	16 38 14.8	306.6	68.40	15 45.3	57 43.8	
2	U	15 49.49	2.161	20 32 39.71	139.89	15 30 22.7	370.5	67.38	15 37.6	57 15.7	II. N.
3	L	4 15.01	2.092	21 0 13.35	135.73	14 10 41.6	424.8	66.37	15 30.2	56 48.4	
3	U	16 39.72	2.026	21 26 58.14	131.77	-12 41 4.5	+469.9	65.39	15 23.1	56 22.4	II. N.
4	L	5 3.67	1.966	21 52 57.25	128.14	11 3 17.9	506.5	64.46	15 16.4	55 58.0	
4	U	17 26.93	1.912	22 18 15.04	121.90	9 18 59.7	535.2	63.63	15 10.3	55 35.6	II. N.
5	L	5 49.59	1.866	22 42 56.72	122.12	7 29 39.6	556.9	62.91	15 4.9	55 15.5	
5	U	18 11.75	1.828	23 7 7.99	119.84	- 5 36 38.1	+572.2	62.30	15 0.1	54 57.9	II. N.
6	L	6 33.50	1.798	23 30 54.85	118.06	3 41 8.3	581.8	61.82	14 56.0	54 42.9	
6	U	18 54.94	1.777	23 54 23.40	116.78	- 1 44 16.8	585.9	61.46	14 52.6	54 30.4	II. N.
7	L	7 16.18	1.764	0 17 39.73	116.02	+ 0 12 54.1	585.0	61.23	14 49.9	54 20.6	
7	U	19 37.32	1.760	0 40 49.80	115.74	+ 2 9 25.1	+579.3	61.14	14 48.0	54 13.5	II. N.
8	L	7 58.45	1.763	1 3 59.39	115.94	4 4 19.0	568.8	61.17	14 46.7	54 8.9	
8	U	20 19.67	1.774	1 27 14.01	116.57	5 56 37.7	553.5	61.32	14 46.1	54 6.8	II. N.
9	L	8 41.05	1.791	1 50 38.85	117.62	7 45 23.0	533.1	61.58	14 46.2	54 7.0	
9	U	21 2.68	1.815	2 14 18.60	119.06	+ 9 29 34.1	+507.7	61.93	14 46.9	54 9.4	II. N.

May 29, U Defective Illumination of I. 0.00.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
June 9	U	21 2.68	1.815	2 14 18.60	119.06	+ 9 29 34.1	+507.7	61.93	14 46.9	54 9.4	II. N.
10	L	9 24.64	1.844	2 38 17.52	120.81	11 8 7.5	476.9	62.37	14 48.1	54 13.9	
10	U	21 46.97	1.878	3 2 39.25	122.83	12 39 57.0	440.4	62.87	14 49.8	54 20.2	II. N.
11	L	10 9.72	1.915	3 27 26.58	125.07	14 3 54.3	398.1	63.43	14 52.0	54 28.2	
11	U	22 32.93	1.954	3 52 41.48	127.43	+15 18 48.5	+350.0	64.02	14 54.6	54 37.8	II. N.
12	L	10 56.62	1.994	4 18 24.86	129.80	16 23 28.6	295.9	64.62	14 57.5	54 48.6	
12	U	23 20.78	2.032	4 44 36.51	132.12	17 16 45.3	236.1	65.20	15 0.8	55 0.6	
13	L	11 45.38	2.068	5 11 15.04	134.27	17 57 32.8	171.0	65.74	15 4.3	55 13.5	
14	U	0 10.39	2.099	5 38 17.92	136.16	+18 24 52.4	+101.5	66.22	15 8.1	55 27.2	
14	L	12 35.74	2.125	6 5 41.57	137.71	18 37 55.1	+ 28.4	66.62	15 12.0	55 41.5	
15	U	1 1.37	2.145	6 33 21.59	138.89	18 36 4.1	- 47.2	66.92	15 16.0	55 56.4	I. N.
15	L	13 27.19	2.157	7 1 13.09	139.63	18 18 57.4	123.9	67.13	15 20.2	56 11.6	
16	U	1 53.11	2.163	7 29 11.10	139.97	+17 46 29.3	-200.5	67.23	15 24.4	56 27.1	I. N.
16	L	14 19.06	2.162	7 57 10.88	139.94	16 58 51.2	275.4	67.25	15 28.7	56 42.8	
17	U	2 44.98	2.157	8 25 8.39	139.61	15 56 31.0	347.3	67.20	15 33.0	56 58.7	I. N.
17	L	15 10.81	2.118	8 53 0.55	139.06	14 40 12.2	415.0	67.09	15 37.3	57 14.7	
18	U	3 36.51	2.137	9 20 45.46	138.11	+13 10 51.9	-477.4	66.96	15 41.7	57 30.7	I. N.
18	L	16 2.09	2.126	9 48 22.55	137.78	11 29 39.8	533.5	66.83	15 46.1	57 46.7	
19	U	4 27.55	2.117	10 15 52.55	137.25	9 37 55.2	582.6	66.72	15 50.4	58 2.7	I. N.
19	L	16 52.92	2.112	10 43 17.38	136.93	7 37 6.8	624.1	66.65	15 54.7	58 18.4	
20	U	5 18.26	2.112	11 10 40.09	136.91	+ 5 28 50.7	-657.1	66.66	15 58.9	58 33.9	I. N.
20	L	17 43.63	2.117	11 38 4.56	137.24	3 14 49.9	681.4	66.76	16 3.0	58 49.0	
21	U	6 9.10	2.129	12 5 35.42	137.97	+ 0 56 54.7	696.2	66.95	16 7.0	59 3.4	I. N.
21	L	18 34.76	2.149	12 33 17.60	139.13	- 1 22 58.0	700.9	67.23	16 10.6	59 16.9	
22	U	7 0.70	2.175	13 1 16.22	140.71	- 3 42 43.6	-694.9	67.60	16 13.9	59 29.1	I. N.
22	L	19 26.99	2.207	13 29 36.15	142.67	6 0 10.7	677.6	68.08	16 16.9	59 39.9	
23	U	7 53.70	2.245	13 58 21.66	144.96	8 13 0.6	648.6	68.63	16 19.4	59 48.9	I. N.
23	L	20 20.89	2.287	14 27 35.99	147.45	10 18 50.2	607.5	69.21	16 21.2	59 55.6	
24	U	8 48.59	2.330	14 57 20.97	150.03	-12 15 13.8	-551.3	69.81	16 22.3	59 59.8	I. N.
24	L	21 16.80	2.371	15 27 36.48	152.52	13 59 47.7	489.4	70.38	16 22.7	60 1.1	
25	U	9 45.48	2.408	15 58 20.22	154.71	15 30 16.2	413.7	70.87	16 22.2	59 59.3	I. N.
25	L	22 14.55	2.436	16 29 27.41	156.39	16 44 38.4	328.7	71.25	16 20.8	59 54.2	
26	U	10 43.89	2.452	17 0 50.94	157.40	-17 41 16.2	-236.6	71.46	16 18.5	59 45.9	I. N.
26	L	23 13.35	2.455	17 32 21.71	157.58	18 19 0.0	140.1	71.49	16 15.4	59 34.3	
27	U	11 42.76	2.443	18 3 49.18	156.85	18 37 15.0	- 42.3	71.31	16 11.4	59 19.6	I. N.
28	L	0 11.93	2.416	18 35 2.44	155.22	18 36 2.9	+ 53.9	70.92	16 6.6	59 2.1	
28	U	12 40.69	2.375	19 5 51.04	152.75	-18 16 0.3	+145.6	70.34	16 1.2	58 42.3	II. N.
29	L	1 8.89	2.323	19 36 5.93	149.62	17 38 15.0	230.6	69.60	15 55.3	58 20.5	
29	U	13 36.41	2.263	20 5 40.09	146.00	16 44 18.8	307.2	68.74	15 49.0	57 57.3	II. N.
30	L	2 3.18	2.198	20 34 28.80	142.09	15 35 59.6	374.3	67.80	15 42.4	57 33.2	
30	U	14 29.15	2.131	21 2 29.80	138.08	-14 15 14.1	+431.6	66.83	15 35.7	57 8.8	II. N.
July 1	L	2 54.33	2.066	21 29 43.04	134.15	12 44 0.4	479.1	65.87	15 29.1	56 44.5	
1	U	15 18.75	2.004	21 56 10.32	130.44	11 4 13.3	517.3	64.95	15 22.7	56 21.0	II. N.
2	L	3 42.46	1.948	22 21 54.94	127.05	9 17 40.9	546.8	64.10	15 16.6	55 58.5	
2	U	16 5.53	1.898	22 47 1.33	124.07	- 7 26 2.2	+568.5	63.35	15 10.9	55 37.6	II. N.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Passing Meridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	"	"	
July 2	U	16 55.53	1.898	22 47 1.33	121.07	- 7 26 2.2	+568.5	63.35	15 10.9	55 37.6	II. N.
3	L	4 28.05	1.886	23 11 34.70	121.55	5 30 47.0	583.6	62.71	15 5.7	55 18.6	
3	U	16 50.12	1.823	23 35 40.72	119.53	3 33 16.2	591.2	62.19	15 1.1	55 1.6	II. N.
4	L	5 11.84	1.798	23 59 25.36	118.00	- 1 34 42.6	593.6	61.79	14 57.1	54 47.0	
4	U	17 33.30	1.781	0 22 54.73	116.98	+ 0 23 47.4	+590.6	61.52	14 53.8	54 35.0	II. N.
5	L	5 54.60	1.772	0 46 14.90	116.16	2 21 12.6	582.8	61.39	14 51.3	54 25.6	
5	U	18 15.85	1.772	1 9 31.88	116.44	4 16 35.1	570.1	61.38	14 49.4	54 18.9	II. N.
6	L	6 37.15	1.779	1 32 51.45	116.90	6 8 58.4	552.8	61.50	14 48.3	54 14.9	
6	U	18 58.58	1.791	1 56 19.22	117.81	+ 7 57 26.5	+530.9	61.73	14 48.0	54 13.6	II. N.
7	L	7 20.24	1.816	2 20 0.39	119.13	9 41 2.0	504.1	62.07	14 48.4	54 15.0	
7	U	19 42.20	1.811	2 43 59.74	120.83	11 18 45.7	472.2	62.50	14 49.4	54 18.9	II. N.
8	L	8 4.53	1.878	3 8 21.54	122.85	12 49 35.1	435.1	63.01	14 51.2	54 25.3	
8	U	20 27.29	1.916	3 33 9.33	125.15	+14 12 25.2	+392.1	63.58	14 53.6	54 34.0	II. N.
9	L	8 50.53	1.957	3 58 25.77	127.62	15 26 7.7	313.8	64.19	14 56.5	54 44.8	
9	U	21 14.27	2.000	4 24 12.55	130.18	16 29 32.7	289.4	64.83	14 59.9	54 57.4	II. N.
10	L	9 38.53	2.043	4 50 30.23	132.75	17 21 29.9	229.2	65.16	15 3.8	55 11.7	
10	U	22 3.29	2.083	5 17 18.01	135.19	+18 0 51.6	+163.5	66.05	15 8.1	55 27.3	II. N.
11	L	10 28.51	2.120	5 44 33.86	137.40	18 26 34.6	92.9	66.58	15 12.6	55 43.9	
11	U	22 54.15	2.152	6 12 14.43	139.30	18 37 41.3	+ 18.1	67.03	15 17.3	56 1.3	II. N.
12	L	11 20.12	2.176	6 40 15.33	140.79	18 33 38.6	- 59.4	67.39	15 22.2	56 19.1	
12	U	23 46.34	2.193	7 8 31.36	141.81	+18 13 50.1	-138.7	67.64	15 27.1	56 37.0	
13	L	12 12.72	2.202	7 36 56.90	142.36	17 38 9.6	217.9	67.77	15 31.9	56 54.8	
14	U	0 39.17	2.201	8 5 26.37	142.17	16 46 47.9	295.3	67.80	15 36.6	57 12.2	
14	L	13 5.60	2.200	8 33 54.75	142.20	15 40 15.6	369.3	67.74	15 41.2	57 28.9	
15	U	1 31.94	2.190	9 2 17.80	141.61	+14 19 22.5	-438.5	67.61	15 45.5	57 44.7	I. N.
15	L	13 58.15	2.177	9 30 32.54	140.83	12 45 16.4	501.3	67.44	15 49.5	57 59.5	
16	U	2 24.18	2.163	9 58 37.32	139.97	10 59 19.7	556.7	67.26	15 53.3	58 13.2	I. N.
16	L	14 50.05	2.149	10 26 31.92	139.15	9 3 7.6	603.7	67.08	15 56.7	58 25.7	
17	U	3 15.77	2.138	10 54 17.40	138.47	+ 6 58 25.0	-641.7	66.94	15 59.8	58 36.9	I. N.
17	L	15 41.37	2.130	11 21 56.09	138.03	4 47 3.6	670.2	66.86	16 2.5	58 46.9	
18	U	4 6.92	2.128	11 49 31.28	137.89	2 31 0.4	688.6	66.85	16 4.8	58 55.6	I. N.
18	L	16 32.47	2.132	12 17 7.01	138.13	+ 0 12 16.4	696.9	66.93	16 6.8	59 3.0	
19	U	4 58.11	2.112	12 44 47.83	138.75	- 2 7 5.0	-691.9	67.10	16 8.5	59 9.1	I. N.
19	L	17 23.91	2.159	13 12 38.43	139.76	4 24 57.9	682.2	67.36	16 9.8	59 14.0	
20	U	5 49.95	2.182	13 40 43.46	141.13	6 39 15.0	658.9	67.71	16 10.8	59 17.7	I. N.
20	L	18 16.30	2.210	14 9 7.07	142.84	8 47 48.3	624.9	68.14	16 11.5	59 20.0	
21	U	6 43.02	2.243	14 37 52.58	144.78	-10 48 29.6	-580.2	68.61	16 11.8	59 21.0	I. N.
21	L	19 10.13	2.277	15 7 2.17	146.83	12 39 12.7	525.2	69.09	16 11.6	59 20.5	
22	U	7 37.65	2.311	15 36 36.46	148.87	14 17 56.2	460.3	69.56	16 11.0	59 18.4	I. N.
22	L	20 5.57	2.341	16 6 34.29	150.73	15 42 46.6	386.6	69.99	16 10.0	59 14.7	
23	U	8 33.82	2.366	16 36 52.48	152.23	-16 52 3.8	-305.1	70.33	16 8.6	59 9.3	I. N.
23	L	21 2.33	2.383	17 7 25.85	153.23	17 44 25.3	217.6	70.54	16 6.6	59 2.0	
24	U	9 30.97	2.389	17 38 7.43	153.59	18 18 51.3	126.3	70.59	16 4.1	58 52.8	I. N.
24	L	21 59.62	2.383	18 8 48.95	153.21	18 34 49.4	- 33.4	70.47	16 1.1	58 41.8	
25	U	10 28.11	2.364	18 39 21.41	152.07	-18 32 16.1	+ 58.5	70.18	15 57.6	58 29.0	I. N.S.

July 25, U. Defective Illumination of S. 0'.42.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Meri- dian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
July 25	U	10 28.11	2.364	18 39 21.41	152.07	-18 32 16.1	+ 58.5	70.18	15 57.6	58 29.0	I. N.S.
25	L	22 56.30	2.333	19 9 35.92	150.22	18 11 37.9	147.0	69.71	15 53.6	58 14.4	
26	U	11 24.06	2.292	19 39 24.36	147.76	17 33 48.5	230.1	69.10	15 49.2	57 58.2	I. N.S.
26	L	23 51.28	2.243	20 8 39.95	141.78	16 40 4.6	305.9	68.36	15 44.4	57 40.7	
27	U	12 17.86	2.188	20 37 17.77	141.48	-15 32 0.6	+373.3	67.55	15 39.4	57 22.1	I. II. N.
28	L	0 43.77	2.130	21 5 14.78	138.01	14 11 22.5	431.6	66.70	15 34.1	57 2.8	
28	U	13 8.98	2.072	21 32 29.92	131.52	12 40 1.6	480.4	65.83	15 28.7	56 43.0	II. N.
29	L	1 33.51	2.016	21 59 3.81	131.16	10 59 50.1	520.0	64.99	15 23.3	56 23.2	
29	U	13 57.39	1.964	22 24 58.56	128.02	- 9 12 36.6	+550.8	64.20	15 18.0	56 3.7	II. N.
30	L	2 20.67	1.917	22 50 17.45	125.20	7 20 3.9	573.3	63.49	15 12.9	55 45.0	
30	U	14 43.42	1.876	23 15 4.63	122.74	5 23 47.4	588.2	62.88	15 8.1	55 27.2	II. N.
31	L	3 5.72	1.842	23 39 24.85	120.71	3 25 14.3	596.2	62.37	15 3.6	55 10.8	
31	U	15 27.67	1.816	0 3 23.31	119.12	- 1 25 43.8	+597.8	61.98	14 59.6	54 56.1	II. N.
Aug. 1	L	3 49.34	1.797	0 27 5.43	117.98	+ 0 33 31.6	593.7	61.70	14 56.1	54 43.3	
1	U	16 10.83	1.786	0 50 36.74	117.31	2 31 25.5	584.3	61.55	14 53.2	54 32.7	II. N.
2	L	4 32.23	1.782	1 14 2.81	117.11	4 26 56.4	569.9	61.51	14 50.9	54 24.4	
2	U	16 53.64	1.787	1 37 29.13	117.35	+ 6 19 6.0	+550.8	61.60	14 49.1	54 18.7	II. N.
3	L	5 15.14	1.798	2 1 0.99	118.03	8 6 57.7	527.0	61.80	14 48.6	54 15.6	
3	U	17 36.82	1.816	2 24 43.54	119.13	9 49 35.5	498.5	62.10	14 48.5	54 15.2	II. N.
4	L	5 58.76	1.811	2 48 41.58	120.60	11 26 3.2	465.3	62.50	14 49.1	54 17.6	
4	U	18 21.02	1.871	3 12 59.46	122.43	+12 55 22.2	+427.0	62.98	14 50.5	54 22.7	II. N.
5	L	6 43.68	1.906	3 37 41.02	121.54	14 16 32.7	383.8	63.52	14 52.6	54 30.5	
5	U	19 6.79	1.915	4 2 49.43	126.89	15 28 31.6	335.1	64.12	14 55.4	54 40.9	II. N.
6	L	7 30.38	1.987	4 28 27.02	129.39	16 30 14.6	281.0	64.75	14 58.9	54 53.8	
6	U	19 54.48	2.030	4 54 35.11	131.96	+17 20 36.1	+221.6	65.39	15 3.1	55 9.0	II. N.
7	L	8 19.09	2.072	5 21 13.95	134.50	17 58 30.8	156.7	66.00	15 7.8	55 26.3	
7	U	20 44.19	2.112	5 48 22.56	136.91	18 22 56.5	86.8	66.58	15 13.0	55 45.4	II. N.
8	L	9 9.75	2.118	6 15 58.75	139.08	18 32 57.6	+ 12.6	67.09	15 18.6	56 5.9	
8	U	21 35.71	2.179	6 43 59.18	140.94	+18 27 46.8	- 65.0	67.52	15 24.5	56 27.5	II. N.
9	L	10 2.01	2.203	7 12 19.57	142.10	18 6 50.6	141.8	67.86	15 30.6	56 49.8	
9	U	22 28.56	2.220	7 40 55.02	143.44	17 29 51.4	225.1	68.09	15 36.7	57 12.2	II. N.
10	L	10 55.27	2.230	8 9 40.31	144.05	16 36 51.2	304.5	68.21	15 42.7	57 34.4	
10	U	23 22.06	2.234	8 38 30.35	144.24	+15 28 13.1	-381.2	68.24	15 48.5	57 55.8	
11	L	11 48.85	2.231	9 7 20.67	144.09	14 4 41.7	453.2	68.20	15 54.1	58 16.1	
11	U	0 15.59	2.224	9 36 7.60	143.69	12 27 23.1	518.7	68.10	15 59.2	58 34.8	
12	L	12 42.23	2.215	10 4 48.66	143.13	10 37 43.3	576.4	67.97	16 3.7	58 51.4	
13	U	1 8.75	2.205	10 33 22.59	142.52	+ 8 37 25.0	-621.9	67.83	16 7.6	59 5.8	I. N.
13	L	13 35.15	2.196	11 1 49.33	141.95	6 28 25.2	663.2	67.71	16 10.8	59 17.7	
14	U	2 1.46	2.189	11 30 10.08	141.53	4 12 51.9	690.5	67.63	16 13.4	59 27.0	I. N.
14	L	14 27.69	2.185	11 58 26.95	141.32	+ 1 52 59.8	706.2	67.60	16 15.2	59 33.6	
15	U	2 53.92	2.186	12 26 42.81	141.37	- 0 28 51.8	-710.3	67.64	16 16.2	59 37.5	I. N.
15	L	15 20.18	2.192	12 55 1.03	141.71	2 50 21.4	702.7	67.75	16 16.6	59 39.0	
16	U	3 46.53	2.202	13 23 25.14	142.36	5 9 9.6	683.4	67.94	16 16.4	59 38.1	I. N.
16	L	16 13.05	2.217	13 51 58.61	143.27	7 22 59.2	652.9	68.19	16 15.6	59 35.1	
17	U	4 39.77	2.236	14 20 44.41	144.40	- 9 29 36.9	-611.6	68.50	16 14.3	59 30.2	I. N.

July 25, U Defective Illumination of S. 0'.42.
 July 26, U Defective Illumination of S. 0'.13.

July 27, U Defective Illumination of I. 0'.06.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi- diameter.	Equa- torial Hor- izontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Aug. 17	U	4 39.77	2.236	14 20 44.41	144.40	- 9 29 36.9	-611.6	68.50	16 14.3	59 30.2	I. N.
17	L	17 6.73	2.258	14 49 44.81	145.68	11 26 57.1	560.1	68.83	16 12.5	59 23.6	
18	U	5 33.95	2.280	15 19 1.03	147.02	13 13 1.8	499.2	69.16	16 10.3	59 15.6	I. N.
18	L	18 1.44	2.301	15 48 33.05	148.29	14 46 4.1	429.9	69.47	16 7.8	59 6.4	
19	U	6 29.16	2.319	16 18 19.31	149.37	-16 4 30.1	-353.4	69.73	16 5.0	58 56.1	I. N.
19	L	18 57.07	2.332	16 48 16.80	150.11	17 7 1.8	271.1	69.90	16 2.0	58 45.0	
20	U	7 25.10	2.338	17 18 21.02	150.49	17 52 40.4	184.8	69.96	15 58.7	58 33.0	I. N.
20	L	19 53.14	2.335	17 48 26.31	150.31	18 20 48.2	96.3	69.89	15 55.2	58 20.4	
21	U	8 21.09	2.322	18 18 26.16	149.57	-18 31 10.3	- 7.5	69.68	15 51.6	58 7.2	I. N.S.
21	L	20 48.83	2.300	18 48 13.72	148.26	18 23 55.9	+ 79.5	69.33	15 47.8	57 53.3	
22	U	9 16.26	2.270	19 17 42.32	146.43	17 59 37.1	162.9	68.85	15 43.9	57 39.0	I. N.S.
22	L	21 43.28	2.232	19 46 46.06	144.14	17 19 6.7	211.1	68.26	15 39.7	57 24.2	
23	U	10 9.80	2.188	20 15 20.07	141.49	-16 23 35.8	+312.8	67.58	15 35.7	57 8.9	I. S.
23	L	22 35.77	2.140	20 43 20.83	138.61	15 14 28.5	377.0	66.84	15 31.5	56 53.3	
24	U	11 1.16	2.090	21 10 46.27	135.62	13 53 19.3	433.1	66.07	15 27.2	56 37.5	I. S.
24	L	23 25.94	2.041	21 37 35.79	132.64	12 21 48.0	180.6	65.31	15 22.9	56 21.6	
25	U	11 50.14	1.993	22 3 50.09	129.77	-10 41 36.8	+519.7	64.57	15 18.5	56 5.6	I. N.S.
26	L	0 13.79	1.948	22 29 30.98	127.09	8 54 26.5	550.5	63.87	15 14.2	55 49.8	
26	U	12 36.92	1.908	22 54 41.20	121.67	7 1 55.2	573.3	63.24	15 10.0	55 34.5	II. N.S.
27	L	0 59.61	1.873	23 19 24.22	122.57	5 5 36.3	588.5	62.70	15 6.0	55 19.7	
27	U	13 21.91	1.814	23 43 44.02	120.80	- 3 6 57.4	+596.8	62.26	15 2.2	55 5.7	II. N.
28	L	1 43.89	1.821	0 7 44.92	119.41	- 1 7 20.6	598.3	61.91	14 58.7	54 52.8	
28	U	14 5.63	1.804	0 31 31.51	118.42	+ 0 51 58.0	593.3	61.67	14 55.5	54 41.2	II. N.
29	L	2 27.22	1.794	0 55 8.49	117.81	2 49 47.9	583.5	61.54	14 52.7	54 31.0	
29	U	14 48.73	1.791	1 18 40.58	117.60	+ 4 45 2.3	+568.0	61.51	14 50.4	54 22.6	II. N.
30	L	3 10.23	1.794	1 42 12.47	117.77	6 36 39.1	547.4	61.59	14 48.7	54 16.2	
30	U	15 31.80	1.803	2 5 48.75	118.33	8 23 38.4	521.8	61.77	14 47.5	54 11.9	II. N.
31	L	3 53.52	1.818	2 29 33.80	119.23	10 5 2.8	491.5	62.05	14 47.0	54 9.9	
31	U	16 15.46	1.839	2 53 31.79	120.48	+11 39 55.5	+456.5	62.41	14 47.1	54 10.4	II. N.
Sept. 1	L	4 37.67	1.864	3 17 46.56	122.03	13 7 20.2	416.8	62.84	14 47.9	54 13.4	
1	U	17 0.22	1.894	3 42 21.51	123.84	14 26 20.2	372.3	63.34	14 49.5	54 19.1	II. N.
2	L	5 23.15	1.928	4 7 19.54	125.87	15 35 57.9	323.1	63.88	14 51.8	54 27.5	
2	U	17 46.51	1.965	4 32 42.89	128.05	+16 35 15.7	+269.0	64.46	14 54.8	54 38.7	II. N.
3	L	6 10.31	2.003	4 58 33.10	130.33	17 23 15.3	210.1	65.05	14 58.6	54 52.6	
3	U	18 34.57	2.041	5 24 50.85	132.63	17 58 59.5	146.5	65.63	15 3.1	55 9.0	II. N.
4	L	6 59.28	2.078	5 51 35.98	134.87	18 21 33.1	78.4	66.18	15 8.2	55 27.9	
4	U	19 24.43	2.113	6 18 47.35	136.99	+18 30 5.5	+ 6.3	66.70	15 14.0	55 49.1	II. N.
5	L	7 49.98	2.145	6 46 22.97	138.91	18 23 52.8	- 69.0	67.16	15 20.3	56 12.3	
5	U	20 15.89	2.173	7 14 20.08	140.57	18 2 20.4	146.7	67.54	15 27.1	56 37.1	II. S.
6	L	8 42.10	2.195	7 42 35.38	141.93	17 25 6.6	225.6	67.84	15 34.2	57 3.2	
6	U	21 8.55	2.213	8 11 5.18	142.98	+16 32 5.0	-304.4	68.07	15 41.5	57 29.9	II. S.
7	L	9 35.19	2.225	8 39 45.84	143.74	15 23 27.5	381.4	68.22	15 48.8	57 56.8	
7	U	22 1.95	2.233	9 8 33.92	144.23	13 59 45.5	454.9	68.31	15 56.0	58 23.3	II. S.
8	L	10 28.78	2.238	9 37 26.52	144.51	12 21 52.1	523.0	68.36	16 3.0	58 48.7	
8	U	22 55.65	2.240	10 6 21.53	144.64	+10 31 1.9	-584.0	68.37	16 9.4	59 12.4	II. S.

Aug. 21, U Defective Illumination of S. 0''.08.
 Aug. 22, U Defective Illumination of N. 0''.68.

Aug. 25, U Defective Illumination of N. 0''.02.
 Aug. 26, U Defective Illumination of S. 0''.92.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Me- ridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Sept. 8	U	22 55.65	2.240	10 6 21.53	144.04	+10 31 1.9	-584.0	68.37	16 9.4	59 12.4	II. S.
9	L	11 22.54	2.241	10 35 17.68	144.71	8 28 50.4	636.3	68.37	16 15.2	59 33.7	
9	U	23 49.44	2.243	11 4 14.64	144.79	6 17 12.8	678.2	68.38	16 20.2	59 52.2	
10	L	12 16.37	2.245	11 33 12.96	144.94	3 58 20.6	708.5	68.42	16 24.3	60 7.2	
11	U	0 43.34	2.250	12 2 13.90	145.23	+ 1 34 39.4	-726.2	68.51	16 27.4	60 18.4	
11	L	13 10.39	2.258	12 31 19.25	145.69	- 0 51 15.3	730.6	68.64	16 29.4	60 25.6	
12	U	1 37.54	2.268	13 0 31.12	146.32	3 16 42.3	721.5	68.81	16 30.2	60 28.8	I. N.
12	L	14 4.83	2.281	13 29 51.62	147.12	5 38 59.1	699.0	69.03	16 30.0	60 28.0	
13	U	2 32.30	2.297	13 59 22.52	148.04	- 7 55 26.1	-663.4	69.28	16 28.7	60 23.3	I. N.
13	L	14 59.96	2.314	14 29 5.04	149.04	10 3 31.4	615.5	69.56	16 26.5	60 15.2	
14	U	3 27.82	2.330	14 58 59.47	150.02	12 0 54.1	556.5	69.83	16 23.5	60 4.1	I. N.
14	L	15 55.87	2.344	15 29 5.02	150.88	13 45 28.5	487.8	70.06	16 19.7	59 50.3	
15	U	4 24.06	2.355	15 59 19.63	151.51	-15 15 27.6	-411.0	70.24	16 15.4	59 34.5	I. N.
15	L	16 52.35	2.360	16 29 40.02	151.82	16 29 24.8	327.8	70.33	16 10.7	59 17.1	
16	U	5 20.67	2.358	17 0 1.69	151.72	17 26 17.5	240.4	70.31	16 5.6	58 58.6	I. N.
16	L	17 48.91	2.348	17 30 19.26	151.13	18 5 26.8	150.9	70.18	16 0.4	58 39.4	
17	U	6 16.99	2.330	18 0 26.75	150.03	-18 26 38.7	- 61.3	69.92	15 55.1	58 19.9	I. N.S.
17	L	18 44.80	2.304	18 30 18.15	148.44	18 30 2.7	+ 26.7	69.53	15 49.8	58 0.3	
18	U	7 12.24	2.270	18 59 47.69	146.40	18 16 10.0	111.4	69.01	15 44.5	57 41.0	I. S.
18	L	19 39.24	2.230	19 28 50.39	143.99	17 45 50.8	191.0	68.39	15 39.4	57 22.1	
19	U	8 5.73	2.185	19 57 22.32	141.30	-17 0 10.5	+264.6	67.70	15 34.4	57 3.8	I. S.
19	L	20 31.66	2.137	20 25 20.76	138.12	16 0 26.4	331.5	66.95	15 29.6	56 46.1	
20	U	8 57.01	2.088	20 52 44.27	135.49	14 48 3.9	390.9	66.17	15 24.9	56 29.0	I. S.
20	L	21 21.78	2.040	21 19 32.68	132.59	13 24 33.8	442.7	65.40	15 20.4	56 12.7	
21	U	9 45.98	1.991	21 45 46.93	129.81	-11 51 28.9	+186.8	64.66	15 16.2	55 57.1	I. S.
21	L	22 9.65	1.951	22 11 28.93	127.23	10 10 22.1	523.0	63.97	15 12.2	55 42.3	
22	U	10 32.82	1.912	22 36 41.35	124.89	8 22 45.1	551.8	63.34	15 8.4	55 28.3	I. S.
22	L	22 55.55	1.878	23 1 27.48	122.84	6 30 7.1	573.3	62.78	15 4.7	55 15.0	
23	U	11 17.91	1.819	23 25 50.96	121.12	- 4 33 54.2	+587.8	62.31	15 1.3	55 2.5	I. S.
23	L	23 39.96	1.826	23 49 55.80	119.74	2 35 28.6	595.5	61.94	14 58.2	54 50.9	
24	U	12 1.77	1.809	0 13 46.12	118.71	- 0 36 9.5	596.7	61.66	14 55.3	54 40.3	I. II. N.S.
25	L	0 23.41	1.798	0 37 26.14	118.02	+ 1 22 48.3	591.9	61.48	14 52.7	54 30.7	
25	U	12 44.94	1.792	1 1 0.01	117.68	+ 3 20 12.7	+581.2	61.40	14 50.4	54 22.2	II. N.S.
26	L	1 6.44	1.792	1 24 31.86	117.68	5 14 55.1	565.0	61.42	14 48.4	54 15.0	
26	U	13 27.97	1.798	1 48 5.67	118.01	7 5 49.6	543.3	61.53	14 46.8	54 9.2	II. N.
27	L	1 49.60	1.808	2 11 45.22	118.64	8 51 52.7	516.4	61.73	14 45.7	54 5.0	
27	U	14 11.38	1.823	2 35 34.03	119.55	+10 32 3.2	+484.5	62.00	14 45.0	54 2.5	II. N.
28	L	2 33.37	1.842	2 59 35.32	120.71	12 5 21.8	447.7	62.34	14 44.8	54 1.9	
28	U	14 55.62	1.865	3 23 51.97	122.09	13 30 50.1	406.1	62.75	14 45.2	54 3.3	II. N.
29	L	3 18.16	1.892	3 48 26.40	123.67	14 47 31.8	360.0	63.20	14 46.2	54 6.9	
29	U	15 41.03	1.920	4 13 20.61	125.38	+15 54 31.3	+309.2	63.68	14 47.8	54 12.8	II. N.
30	L	4 4.25	1.950	4 38 35.97	127.19	16 50 55.3	254.0	64.18	14 50.0	54 21.1	
30	U	16 27.84	1.981	5 4 13.32	129.04	17 35 52.4	194.7	64.69	14 53.0	54 32.0	II. N.
Oct. 1	L	4 51.79	2.012	5 30 12.91	130.89	18 8 33.4	131.5	65.19	14 56.7	54 45.4	
1	U	17 16.11	2.041	5 56 34.33	132.67	+18 28 13.1	+ 64.6	65.66	15 1.0	55 1.4	II. N.S.

Sept. 17, U Defective Illumination of S. 0''.02.
 Sept. 24, U Defective Illumination of I. 0''.04.
 Sept. 24, U Defective Illumination of N. 0''.26.

Sept. 25, U Defective Illumination of S. 0''.37.
 Oct. 1, U Defective Illumination of N. 0''.03.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- d. Pass- ing Mer- idian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Oct. 1	U	17 16.11	2.041	5 56 34.33	132.67	+18 28 13.1	+ 64.6	65.66	15 1.0	55 1.4	II. N.S.
2	L	5 40.78	2.069	6 23 16.59	134.35	18 34 11.0	- 5.4	66.10	15 6.1	55 20.0	
2	U	18 5.77	2.005	6 50 18.28	135.90	18 25 53.0	78.0	66.49	15 11.8	55 41.1	II. S.
3	L	6 31.05	2.118	7 17 37.54	137.28	18 2 52.6	152.4	66.83	15 18.2	56 4.5	
3	U	18 56.59	2.138	7 45 12.35	138.49	+17 24 52.9	-227.7	67.13	15 25.2	56 30.0	II. S.
4	L	7 22.35	2.155	8 13 0.64	139.53	16 31 48.7	302.9	67.37	15 32.6	56 57.3	
4	U	19 48.31	2.170	8 41 0.47	140.42	15 23 47.7	376.9	67.56	15 40.4	57 25.9	II. S.
5	L	8 14.43	2.183	9 9 10.30	141.20	14 1 13.1	448.3	67.73	15 48.5	57 55.5	
5	U	20 40.69	2.195	9 37 29.02	141.91	+12 24 44.2	-515.7	67.88	15 56.6	58 25.5	II. S.
6	L	9 7.10	2.207	10 5 56.20	142.62	10 35 19.1	577.4	68.02	16 4.7	58 55.0	
6	U	21 33.66	2.219	10 34 32.05	143.37	8 34 14.7	631.9	68.17	16 12.4	59 23.4	II. S.
7	L	10 0.37	2.233	11 3 17.44	144.22	6 23 8.6	677.4	68.35	16 19.7	59 50.0	
7	U	22 27.26	2.250	11 32 13.79	145.20	+ 4 3 57.6	-712.4	68.57	16 26.2	60 13.9	II. S.
8	L	10 54.37	2.269	12 1 23.00	146.36	+ 1 38 58.0	735.3	68.83	16 31.8	60 34.4	
8	U	23 21.73	2.291	12 30 47.16	147.70	- 0 49 16.6	741.7	69.15	16 36.3	60 50.9	
9	L	11 49.37	2.316	13 0 28.36	149.20	3 17 58.8	739.8	69.51	16 39.5	61 2.8	
10	U	0 17.32	2.313	13 30 28.30	150.81	- 5 44 11.8	-719.8	69.90	16 41.3	61 9.6	
10	L	12 45.60	2.370	14 0 47.95	152.47	8 4 54.1	684.7	70.31	16 41.8	61 11.3	
11	U	1 14.21	2.397	14 31 27.27	154.06	10 17 7.5	635.1	70.72	16 40.9	61 7.9	I. N.
11	L	13 43.11	2.421	15 2 21.81	155.48	12 18 3.3	572.1	71.08	16 38.6	60 59.5	
12	U	2 12.27	2.439	15 33 37.57	156.58	-14 5 10.1	-497.3	71.37	16 35.1	60 46.6	I. N.
12	L	14 41.61	2.449	16 5 0.88	157.22	15 36 19.7	413.0	71.55	16 30.5	60 29.8	
13	U	3 11.02	2.450	16 36 28.56	157.29	16 49 53.5	321.8	71.60	16 25.0	60 9.7	I. N.
13	L	15 40.38	2.441	17 7 53.25	156.71	17 44 45.1	226.4	71.50	16 18.8	59 47.0	
14	U	4 9.56	2.420	17 39 6.93	155.45	-18 20 22.1	-129.8	71.23	16 12.2	59 22.5	I. N.
14	L	16 38.42	2.388	18 10 1.45	153.53	18 36 45.4	- 34.6	70.79	16 5.2	58 56.9	
15	U	5 6.83	2.316	18 40 29.34	151.02	18 34 25.3	+ 57.1	70.20	15 58.0	58 30.7	I. S.
15	L	17 34.70	2.297	19 10 24.24	148.05	18 14 16.5	113.3	69.49	15 50.9	58 4.6	
16	U	6 1.94	2.242	19 39 41.28	144.74	-17 37 32.9	+222.8	68.69	15 44.0	57 39.1	I. S.
16	L	18 28.50	2.184	20 8 17.37	141.25	16 45 41.3	294.6	67.82	15 37.3	57 14.4	
17	U	6 54.35	2.125	20 36 11.11	137.71	15 40 16.2	358.3	66.92	15 30.9	56 50.9	I. S.
17	L	19 19.50	2.068	21 3 22.72	131.25	14 22 55.3	413.9	66.02	15 24.8	56 28.7	
18	U	7 43.98	2.013	21 29 53.78	130.97	-12 55 16.0	+461.4	65.16	15 19.2	56 8.1	I. S.
18	L	20 7.83	1.963	21 55 47.00	127.95	11 18 53.0	501.1	64.35	15 14.0	55 49.1	
19	U	8 31.11	1.918	22 21 5.90	125.25	9 35 17.9	533.5	63.62	15 9.3	55 31.7	I. S.
19	L	20 53.89	1.879	22 45 54.59	122.92	7 45 57.3	558.8	62.97	15 5.0	55 15.9	
20	U	9 16.24	1.847	23 10 17.55	120.97	- 5 52 13.6	+577.4	62.42	15 1.1	55 1.7	I. S.
20	L	21 38.24	1.821	23 34 19.48	119.42	3 55 25.9	589.5	61.98	14 57.6	54 49.0	
21	U	9 59.97	1.802	23 58 5.14	118.26	- 1 56 49.5	595.6	61.64	14 54.6	54 37.8	I. S.
21	L	22 21.51	1.789	0 21 39.24	117.49	+ 0 2 23.4	595.7	61.40	14 51.9	54 28.0	
22	U	10 42.93	1.782	0 45 6.38	117.09	+ 2 1 2.8	+590.0	61.27	14 49.6	54 19.6	I. S.
22	L	23 4.31	1.782	1 8 30.97	117.06	3 57 59.7	578.6	61.25	14 47.7	54 12.5	
23	U	11 25.72	1.787	1 31 57.16	117.36	5 52 7.2	561.7	61.32	14 46.1	54 6.8	I. S.
23	L	23 47.22	1.797	1 55 28.77	117.96	7 42 18.9	539.3	61.48	14 44.9	54 2.3	
24	U	12 8.86	1.812	2 19 9.32	118.84	+ 9 27 30.0	+511.6	61.72	14 44.1	53 59.2	II. N.S.

Oct. 1, U Defective Illumination of N. 0°.03.

Oct. 24, U Defective Illumination of N. 0°.86.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Mer- idian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Oct. 24	U	12 8.86	1.812	2 19 9.32	118.84	+ 9 27 30.0	+511.6	61.72	14 44.1	53 59.2	II. N.S.
25	L	0 30.70	1.830	2 43 1.86	119.96	11 6 36.0	478.4	62.03	14 43.6	53 57.5	
25	U	12 52.79	1.852	3 7 9.00	121.26	12 38 33.7	440.2	62.39	14 43.5	53 57.1	II. N.S.
26	L	1 15.16	1.876	3 31 32.77	122.72	14 2 21.6	396.9	62.80	14 43.8	53 58.3	
26	U	13 37.82	1.902	3 56 14.70	121.28	+15 17 0.1	+318.7	63.24	14 44.6	54 1.1	II. N.S.
27	L	2 0 8.0	1.928	4 21 15.62	125.88	16 21 32.2	295.9	63.70	14 45.8	54 5.5	
27	U	14 24.10	1.955	4 46 35.80	127.18	17 15 4.5	238.7	64.15	14 47.5	54 11.7	II. N.S.
28	L	2 47.72	1.980	5 12 14.83	129.02	17 56 47.8	177.8	64.58	14 49.7	54 19.9	
28	U	15 11.63	2.001	5 38 11.77	130.45	+18 25 58.1	+113.4	64.99	14 52.5	54 30.1	II. N.S.
29	L	3 35.81	2 026	6 4 25.12	131.75	18 41 57.8	+ 46.2	65.36	14 55.8	54 42.3	
29	U	16 0 2.4	2.015	6 30 53.09	132.88	18 44 16.4	- 23.3	65.68	14 59.8	54 56.8	II. S.
30	L	4 24.88	2.061	6 57 33.63	133.85	18 32 31.1	91.3	65.95	15 4 3.5	55 13.5	
30	U	16 49.69	2.074	7 24 24.68	131.61	+18 6 27.9	-166.2	66.17	15 9.5	55 32.4	II. S.
31	L	5 14.65	2.085	7 51 24.35	135.29	17 26 2.5	238.0	66.35	15 15.2	55 53.6	
31	U	17 39.72	2.094	8 18 31.09	135.82	16 31 19.6	308.9	66.50	15 21.6	56 16.9	II. S.
Nov. 1	L	6 4 8.9	2.102	8 45 43.90	136.31	15 22 34.8	378.2	66.63	15 28.5	56 42.2	
1	U	18 30.16	2.110	9 13 2.41	136.79	+14 0 14.0	-441.8	66.74	15 35.8	57 9.1	II. S.
2	L	6 55.53	2.119	9 40 26.99	137.33	12 24 55.4	507.6	66.87	15 43.6	57 37.5	
2	U	19 21.02	2.130	10 7 58.86	138.00	10 37 29.1	565.8	67.02	15 51.6	58 6.9	II. S.
3	L	7 46.66	2.144	10 35 39.91	138.87	8 38 59.2	618.1	67.21	15 59.7	58 36.8	
3	U	20 12.50	2.163	11 3 32.81	139.99	+ 6 30 44.8	-663.0	67.46	16 7.8	59 6.5	II. S.
4	L	8 38.59	2.186	11 31 40.79	141.39	4 11 21.3	699.3	67.78	16 15.7	59 35.3	
4	U	21 4 9.9	2.215	12 0 7.50	143.11	+ 1 51 42.1	725.1	68.18	16 23.1	60 2.5	II. S.
5	L	9 31.77	2.249	12 28 56.77	145.15	- 0 35 1.6	739.7	68.65	16 29.8	60 27.3	
5	U	21 58.98	2.288	12 58 12.32	147.48	- 3 3 19.9	-710.8	69.19	16 35.6	60 48.8	II. S.
6	L	10 26.69	2.330	13 27 57.34	150.05	5 30 26.2	727.6	69.79	16 40.4	61 6.2	
6	U	22 54.92	2.375	13 58 14.12	152.76	7 53 21.4	698.9	70.43	16 43.9	61 18.9	
7	L	11 23.69	2.420	14 29 3.53	155.17	10 8 57.9	654.5	71.07	16 45.9	61 26.4	
7	U	23 52.99	2.462	15 0 24.54	158.00	-12 14 7.5	-591.6	71.67	16 46.4	61 28.3	
8	L	12 22.76	2.498	15 32 13.91	160.15	14 5 51.3	520.5	72.18	16 45.4	61 24.5	
9	U	0 52.90	2.521	16 4 25.85	161.72	15 41 29.0	134.0	72.57	16 42.9	61 15.2	I. S.
9	L	13 23.29	2.538	16 36 52.25	162.53	16 58 49.3	338.1	72.78	16 39.0	61 0.8	
10	U	1 53.75	2.536	17 9 22.94	162.42	-17 56 18.7	-236.1	72.78	16 33.8	60 41.9	I. S.
10	L	14 24.09	2.518	17 41 46.57	161.35	18 33 5.6	131.6	72.56	16 27.6	60 19.1	
11	U	2 54.12	2.484	18 13 51.50	159.32	18 49 2.4	- 28.3	72.11	16 20.5	59 53.2	I. S.
11	L	15 23.65	2.436	18 45 26.84	156.45	18 44 42.1	+ 70.7	71.47	16 12.9	59 25.2	
12	U	3 52.54	2.377	19 16 23.40	152.89	-18 21 11.9	+163.0	70.65	16 4.9	58 55.8	I. S.
12	L	16 20.68	2.310	19 46 34.28	148.86	17 40 4.6	216.7	69.70	15 56.7	58 25.9	
13	U	4 47.98	2.239	20 15 55.15	141.59	16 43 9.2	320.8	68.68	15 48.6	57 56.0	I. S.
13	L	17 14.42	2.167	20 44 24.18	140.26	15 32 22.7	385.2	67.62	15 40.6	57 26.8	
14	U	5 40.01	2.097	21 12 1.86	136.05	-14 9 43.0	+439.8	66.57	15 33.0	56 58.9	I. S.
14	L	18 4 7.8	2.032	21 38 50.44	132.10	12 37 4.3	485.1	65.57	15 25.9	56 32.5	
15	U	6 28.79	1.972	22 4 53.68	128.52	10 56 13.6	521.9	64.64	15 19.2	56 8.0	I. S.
15	L	18 52.14	1.919	22 30 16.35	125.34	9 8 50.1	550.8	63.80	15 13.1	55 45.5	
16	U	7 14.89	1.874	22 55 3.76	122.63	- 7 16 24.5	+572.3	63.07	15 7.5	55 25.2	I. S.

Oct. 24, U Defective Illumination of N. 0".86.
 Oct. 25, U Defective Illumination of N. 0".00.
 Oct. 26, U Defective Illumination of S. 0".04.

Oct. 27, U Defective Illumination of S. 0".00.
 Oct. 28, U Defective Illumination of N. 0".32.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semid. Pass- ing Me- ridian.	Geocen- tric Semidi- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Nov. 16	U	7 14.89	1.874	22 55 3.76	122.63	- 7 16 24.5	+572.3	63.07	15 7.5	55 25.2	I. S.
16	L	19 37.16	1.838	23 19 21.67	120.42	5 20 19.6	587.4	62.46	15 2.6	55 7.1	
17	U	7 59.03	1.809	23 43 15.96	118.70	3 21 51.4	596.3	61.97	14 58.3	54 51.3	I. S.
17	L	20 20.61	1.789	0 6 52.47	117.47	- 1 22 11.0	599.5	61.60	14 54.6	54 37.7	
18	U	8 41.99	1.776	0 30 16.94	116.69	+ 0 37 34.7	+597.2	61.36	14 51.5	54 26.3	I. S.
18	L	21 3.26	1.770	0 53 34.83	116.36	2 36 21.1	589.7	61.24	14 48.9	54 16.9	
19	U	9 24.50	1.772	1 16 51.36	116.46	4 33 5.3	576.8	61.23	14 46.9	54 9.5	I. S.
19	L	21 45.81	1.780	1 40 11.33	116.93	6 26 45.0	558.9	61.33	14 45.4	54 4.0	
20	U	10 7.24	1.793	2 3 39.12	117.75	+ 8 16 17.0	+535.6	61.53	14 44.4	54 0.2	I. S.
20	L	22 28.87	1.812	2 27 18.67	118.88	10 0 38.5	507.0	61.81	14 43.8	53 58.1	
21	U	10 50.75	1.835	2 51 13.30	120.26	11 38 45.3	473.2	62.15	14 43.6	53 57.5	I. S.
21	L	23 12.92	1.861	3 15 25.66	121.82	13 9 32.8	433.9	62.56	14 43.8	53 58.3	
22	U	11 35.42	1.889	3 39 57.72	123.53	+14 31 57.0	+389.2	63.00	14 44.5	54 0.6	I. II. S.
22	L	23 58.27	1.919	4 4 50.63	125.29	15 44 54.5	339.5	63.46	14 45.4	54 4.1	
23	U	12 21.47	1.948	4 30 4.68	127.04	16 47 24.8	284.8	63.92	14 46.7	54 9.0	II. S.
24	L	0 45.01	1.976	4 55 39.28	128.70	17 38 30.9	225.5	64.37	14 48.4	54 15.2	
24	U	13 8.87	2.001	5 21 33.05	130.22	+18 17 21.3	+162.3	64.79	14 50.5	54 22.7	II. S.
25	L	1 33.01	2.022	5 47 43.81	131.53	18 43 12.0	95.6	65.15	14 52.9	54 31.5	
25	U	13 57.39	2.040	6 14 8.80	132.59	18 55 27.6	+ 26.6	65.45	14 55.6	54 41.6	II. S.
26	L	2 21.95	2.053	6 40 44.86	133.38	18 53 42.4	- 44.2	65.68	14 58.8	54 53.3	
26	U	14 46.65	2.062	7 7 28.70	133.89	+18 37 42.3	-115.8	65.85	15 2.4	55 6.4	II. S.
27	L	3 11.41	2.066	7 34 17.15	134.15	18 7 23.8	187.2	65.95	15 6.4	55 21.0	
27	U	15 36.21	2.067	8 1 7.45	134.21	17 22 55.0	257.4	66.00	15 10.8	55 37.2	II. S.
28	L	4 1.01	2.065	8 27 57.48	134.12	16 24 34.8	325.5	66.00	15 15.6	55 55.0	
28	U	16 25.78	2.063	8 54 45.95	133.96	+15 12 52.5	-390.9	65.99	15 20.9	56 14.4	II. S.
29	L	4 50.51	2.061	9 21 32.53	133.81	13 48 26.6	452.7	65.97	15 26.6	56 35.4	
29	U	17 15.23	2.060	9 48 17.94	133.77	12 12 5.0	510.1	65.98	15 32.7	56 57.8	II. S.
30	L	5 39.96	2.062	10 15 3.87	133.92	10 24 44.1	562.4	66.03	15 39.2	57 21.6	
30	U	18 4.74	2.069	10 41 53.08	134.34	+ 8 27 29.1	-609.0	66.14	15 46.0	57 46.5	II. S.
Dec. 1	L	6 29.64	2.081	11 8 49.17	135.08	6 21 34.6	648.9	66.32	15 53.0	58 12.1	
1	U	18 54.72	2.100	11 35 56.50	136.21	4 8 25.8	681.2	66.60	16 0.1	58 38.1	II. S.
2	L	7 20.07	2.126	12 3 20.01	137.78	+ 1 49 39.5	704.8	66.98	16 7.1	59 4.1	
2	U	19 45.78	2.160	12 31 4.98	139.79	- 0 32 54.4	-718.9	67.46	16 14.0	59 29.4	II. S.
3	L	8 11.93	2.201	12 59 16.83	142.25	2 57 11.0	721.9	68.05	16 20.6	59 53.4	
3	U	20 38.62	2.248	13 28 0.66	145.12	5 20 50.5	712.6	68.72	16 26.6	60 15.4	II. S.
4	L	9 5.91	2.301	13 57 20.90	148.30	7 41 18.2	689.7	69.47	16 31.9	60 34.7	
4	U	21 33.86	2.357	14 27 20.75	151.69	- 9 55 45.6	-652.3	70.26	16 36.2	60 50.6	II. S.
5	L	10 2.49	2.414	14 58 1.66	155.11	12 1 16.2	600.2	71.05	16 39.4	61 2.4	
5	U	22 31.79	2.468	15 29 22.72	158.34	13 54 50.7	533.2	71.80	16 41.3	61 9.6	II. S.
6	L	11 1.69	2.514	16 1 20.16	161.14	15 33 36.8	452.3	72.44	16 41.9	61 11.7	
6	U	23 32.09	2.549	16 33 47.18	163.23	-16 55 0.1	-359.7	72.92	16 41.1	61 8.6	
7	L	12 2.81	2.569	17 6 33.96	164.39	17 56 55.1	258.2	73.19	16 38.8	61 0.3	
8	U	0 33.66	2.570	17 39 28.25	164.46	18 37 55.8	151.4	73.21	16 35.2	60 46.9	
8	L	13 4.41	2.552	18 12 16.38	163.37	18 57 22.3	- 43.2	72.97	16 30.3	60 29.0	
9	U	1 34.82	2.515	18 44 44.53	161.15	-18 55 22.8	+ 62.4	72.47	16 24.3	60 7.2	I. S.

Nov. 22, U Defective Illumination of II. 0°.05.

FOR TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Wash. Mean Time.	Var. per Hour of Long.	Right Ascension of Center.	Var. per Hour of Long.	Geocentric Declination of Center.	Var. per Hour of Long.	S. T. of Semi- Pass- ing Meridian.	Geocen- tric Semi-di- ameter.	Equa- torial Hori- zontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ' "	"	s	' "	' "	
Dec. 9	U	1 34.82	2.515	18 44 44.53	161.15	-18 55 22.8	+ 62.4	72.47	16 24.3	60 7.2	I. S.
9	L	14 4.70	2.462	19 16 40.01	157.95	18 32 49.9	161.8	71.75	16 17.5	59 42.1	I. S.
10	U	2 33.85	2.396	19 47 52.39	154.01	17 51 13.3	252.6	70.84	16 10.0	59 14.6	I. S.
10	L	15 2.16	2.322	20 18 14.16	149.56	16 52 29.1	332.9	69.81	16 2.1	58 45.5	I. S.
11	U	3 29.56	2.244	20 47 40.90	141.88	-15 38 48.5	+401.9	68.70	15 53.9	58 15.5	I. S.
11	L	15 56.03	2.166	21 16 11.26	140.20	14 12 28.2	459.6	67.57	15 45.7	57 45.4	I. S.
12	U	4 21.57	2.092	21 43 46.40	135.71	12 35 41.8	506.4	66.47	15 37.7	57 15.9	I. S.
12	L	16 46.25	2.023	22 10 29.50	131.54	10 50 35.5	543.1	65.43	15 29.9	56 47.5	I. S.
13	U	5 10.14	1.961	22 36 25.23	127.82	- 8 59 4.5	+570.6	64.48	15 22.6	56 20.7	I. S.
13	L	17 33.34	1.907	23 1 39.23	124.60	7 2 52.3	590.0	63.65	15 15.8	55 55.8	I. S.
14	U	5 55.95	1.862	23 26 17.76	121.91	5 3 31.1	602.3	62.94	15 9.7	55 33.1	I. S.
14	L	18 18.08	1.827	23 50 27.31	119.78	3 2 22.3	608.1	62.37	15 4.2	55 12.9	I. S.
15	U	6 39.83	1.800	0 14 14.50	118.18	- 1 0 39.6	+608.1	61.93	14 59.3	54 55.2	I. S.
15	L	19 1.32	1.783	0 37 45.79	117.12	+ 1 0 30.5	602.7	61.63	14 55.2	54 40.1	I. S.
16	U	7 22.66	1.771	1 1 7.50	116.58	3 0 5.9	592.3	61.46	14 51.8	54 27.6	I. S.
16	L	19 43.93	1.773	1 24 25.62	116.52	4 57 7.7	577.1	61.42	14 49.1	54 17.7	I. S.
17	U	8 5.23	1.779	1 47 45.76	116.91	+ 6 50 37.8	+557.1	61.50	14 47.1	54 10.4	I. S.
17	L	20 26.66	1.793	2 11 13.09	117.71	8 39 38.9	532.2	61.68	14 45.8	54 5.4	I. S.
18	U	8 48.28	1.812	2 31 52.35	118.88	10 23 12.2	502.5	61.96	14 45.0	54 2.7	I. S.
18	L	21 10.17	1.837	2 58 47.57	120.37	12 0 17.9	467.6	62.33	14 44.9	54 2.3	I. S.
19	U	9 32.38	1.866	3 23 2.15	122.10	+13 29 54.1	+427.5	62.76	14 45.3	54 3.8	I. S.
19	L	21 54.96	1.897	3 47 38.60	124.01	14 50 58.1	382.2	63.23	14 46.2	54 7.1	I. S.
20	U	10 17.92	1.930	4 12 38.57	126.00	16 2 26.1	331.5	63.73	14 47.6	54 12.1	I. S.
20	L	22 41.29	1.964	4 38 2.68	128.01	17 3 15.3	275.7	64.22	14 49.4	54 18.6	I. S.
21	U	11 5.05	1.996	5 3 50.43	129.93	+17 52 25.5	+215.2	64.70	14 51.5	54 26.5	I. S.
21	L	23 29.18	2.025	5 30 0.26	131.68	18 29 1.8	150.2	65.14	14 54.0	54 35.5	I. S.
22	U	11 53.63	2.050	5 56 29.65	133.17	18 52 15.8	81.6	65.51	14 56.7	54 45.6	I. II. S.
23	L	0 18.35	2.069	6 23 15.12	134.35	19 1 28.9	+ 10.1	65.81	14 59.7	54 56.7	I. II. S.
23	U	12 43.27	2.083	6 50 12.60	135.17	+18 56 14.2	- 62.9	66.03	15 3.0	55 8.6	II. S.
24	L	1 8.31	2.090	7 17 17.72	135.62	18 36 18.3	136.4	66.16	15 6.4	55 21.2	II. S.
24	U	13 33.41	2.092	7 44 26.11	135.72	18 1 41.9	209.4	66.21	15 10.1	55 34.6	II. S.
25	L	1 58.50	2.089	8 11 33.81	135.51	17 12 39.9	280.5	66.18	15 13.9	55 48.7	II. S.
25	U	14 23.52	2.081	8 38 37.51	135.07	+16 9 41.6	-348.7	66.10	15 17.9	56 3.4	II. S.
26	L	2 48.44	2.071	9 5 34.93	134.48	14 53 28.6	112.8	65.98	15 22.1	56 18.7	II. S.
26	U	15 13.23	2.061	9 32 24.89	133.84	13 24 54.0	472.1	65.85	15 26.4	56 34.7	II. S.
27	L	3 37.90	2.051	9 59 7.41	133.26	11 45 0.1	525.8	65.74	15 31.0	56 51.3	II. S.
27	U	16 2.47	2.041	10 25 43.73	132.82	+ 9 54 57.7	-573.4	65.66	15 35.7	57 8.6	II. S.
28	L	4 26.97	2.041	10 52 16.28	132.64	7 56 4.0	611.3	65.64	15 40.5	57 26.4	II. S.
28	U	16 51.47	2.013	11 18 48.48	132.79	5 49 43.3	647.8	65.70	15 45.5	57 44.6	II. S.
29	L	5 16.03	2.052	11 45 24.69	133.33	3 37 25.4	673.7	65.85	15 50.6	58 3.3	II. S.
29	U	17 40.75	2.068	12 12 9.95	134.30	+ 1 20 47.4	-691.2	66.11	15 55.7	58 22.2	II. S.
30	L	6 5.71	2.092	12 39 9.79	135.75	- 0 58 26.9	699.6	66.48	16 0.9	58 41.1	II. S.
30	U	18 31.01	2.125	13 6 30.06	137.70	3 18 24.8	698.3	66.97	16 5.9	58 59.6	II. S.
31	L	6 56.74	2.165	13 34 16.49	140.12	5 37 4.4	686.4	67.56	16 10.8	59 17.5	II. S.
31	U	19 22.99	2.212	14 2 34.49	142.96	- 7 52 14.0	-663.2	68.25	16 15.4	59 34.3	II. S.

Dec. 22, U Defective Illumination of II. 0.01.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 1	1 8	19 49 32.54	-23 9 24.6	7.1	2.7	0.20	Feb. 15	22 31	20 13 23.83	-18 39 44.2	10.2	3.9	0.28
2	1 11	19 56 9.21	22 48 34.3	7.2	2.7	0.20	16	22 30	20 16 18.92	18 42 22.5	10.0	3.8	0.27
3	1 13	20 2 39.41	22 26 19.8	7.3	2.8	0.20	17	22 29	20 19 30.85	18 43 41.7	9.8	3.7	0.26
4	1 16	20 9 2.08	22 2 44.8	7.4	2.8	0.20	18	22 29	20 22 58.08	18 43 41.0	9.7	3.7	0.26
5	1 18	20 15 15.97	21 37 54.2	7.6	2.9	0.21	19	22 28	20 26 39.42	18 42 20.1	9.5	3.6	0.25
6	1 20	20 21 19.72	-21 11 53.5	7.7	2.9	0.21	20	22 28	20 30 33.60	-18 39 38.9	9.4	3.5	0.25
7	1 22	20 27 11.79	20 44 50.0	7.8	3.0	0.21	21	22 29	20 34 39.56	18 35 37.2	9.2	3.5	0.25
8	1 24	20 32 50.43	20 16 51.8	8.0	3.0	0.21	22	22 29	20 38 56.25	18 30 15.0	9.1	3.4	0.24
9	1 25	20 38 13.69	19 48 9.5	8.2	3.1	0.22	23	22 29	20 43 22.81	18 23 32.3	8.9	3.4	0.24
10	1 26	20 43 19.37	19 18 54.6	8.4	3.2	0.23	24	22 30	20 47 58.38	18 15 29.0	8.8	3.3	0.23
11	1 27	20 48 5.10	-18 49 20.8	8.6	3.3	0.23	25	22 31	20 52 42.22	-18 6 5.2	8.7	3.3	0.23
12	1 28	20 52 28.25	18 19 43.9	8.8	3.4	0.24	26	22 32	20 57 33.66	17 55 21.2	8.5	3.2	0.22
13	1 28	20 56 25.98	17 50 21.6	9.1	3.5	0.25	27	22 33	21 2 32.08	17 43 16.9	8.4	3.2	0.22
14	1 27	20 59 55.30	17 21 33.8	9.3	3.6	0.25	28	22 34	21 7 36.90	17 29 52.7	8.3	3.1	0.22
15	1 26	21 2 53.08	16 53 42.1	9.6	3.7	0.26	Mar. 1	22 35	21 12 47.67	17 15 8.7	8.2	3.1	0.22
16	1 25	21 5 16.18	-16 27 9.7	9.9	3.8	0.26	2	22 36	21 18 3.91	-16 59 5.4	8.1	3.1	0.22
17	1 22	21 7 1.57	16 2 20.5	10.2	3.9	0.27	3	22 38	21 23 25.21	16 41 42.5	8.0	3.0	0.21
18	1 20	21 8 6.44	15 39 39.5	10.5	4.0	0.28	4	22 39	21 28 51.22	16 23 0.9	7.9	3.0	0.21
19	1 16	21 8 28.42	15 19 30.1	10.9	4.1	0.29	5	22 41	21 34 21.65	16 3 0.6	7.8	3.0	0.21
20	1 12	21 8 5.77	15 2 14.6	11.2	4.3	0.30	6	22 43	21 39 56.15	15 41 41.8	7.7	2.9	0.20
21	1 7	21 6 57.68	-14 48 12.3	11.5	4.4	0.30	7	22 44	21 45 34.52	-15 19 5.4	7.7	2.9	0.20
22	1 1	21 5 4.45	14 37 38.1	11.9	4.5	0.31	8	22 46	21 51 16.50	14 55 11.0	7.6	2.9	0.20
23	0 54	21 2 27.68	14 30 41.6	12.2	4.6	0.32	9	22 48	21 57 1.93	14 29 59.5	7.5	2.8	0.19
24	0 47	20 59 10.49	14 27 25.6	12.5	4.7	0.32	10	22 50	22 2 50.63	14 3 31.2	7.4	2.8	0.19
25	0 39	20 55 17.49	14 27 46.1	12.8	4.8	0.33	11	22 52	22 8 42.44	13 35 46.4	7.4	2.8	0.19
26	0 31	20 50 54.72	-14 31 31.8	13.0	4.9	0.34	12	22 54	22 14 37.26	-13 6 45.4	7.3	2.8	0.19
27	0 22	20 46 9.48	14 38 25.0	13.2	5.0	0.34	13	22 56	22 20 35.01	12 36 28.8	7.2	2.7	0.18
28	0 13	20 41 9.90	14 48 2.6	13.3	5.0	0.34	14	22 58	22 26 35.61	12 4 57.1	7.2	2.7	0.18
29	0 4	20 36 4.59	14 59 57.6	13.4	5.1	0.35	15	23 0	22 32 39.01	11 32 10.4	7.1	2.7	0.18
29	23 55	20 31 2.03	15 13 41.7	13.4	5.1	0.35	16	23 2	22 38 45.17	10 58 9.7	7.0	2.7	0.18
30	23 47	20 26 10.22	-15 28 45.9	13.4	5.1	0.35	17	23 4	22 44 54.11	-10 22 55.0	7.0	2.7	0.18
31	23 38	20 21 36.23	15 44 43.0	13.3	5.1	0.35	18	23 6	22 51 5.84	9 46 27.1	7.0	2.6	0.18
Feb. 1	23 30	20 17 25.95	16 1 8.1	13.2	5.0	0.35	19	23 9	22 57 20.37	9 8 46.6	6.9	2.6	0.18
2	23 22	20 13 43.94	16 17 39.8	13.1	5.0	0.35	20	23 11	23 3 37.75	8 29 53.9	6.9	2.6	0.18
3	23 15	20 10 33.43	16 33 59.5	12.9	4.9	0.34	21	23 13	23 9 58.07	7 49 49.7	6.8	2.6	0.18
4	23 9	20 7 56.45	-16 49 52.7	12.7	4.8	0.33	22	23 16	23 16 21.39	-7 8 34.8	6.8	2.6	0.18
5	23 3	20 5 53.89	17 5 7.1	12.5	4.7	0.33	23	23 18	23 22 47.80	6 26 10.0	6.7	2.6	0.18
6	22 57	20 4 25.80	17 19 33.4	12.3	4.6	0.32	24	23 21	23 29 17.41	5 42 36.2	6.7	2.5	0.17
7	22 53	20 3 31.49	17 33 3.9	12.0	4.6	0.32	25	23 23	23 35 50.34	4 57 54.4	6.7	2.5	0.17
8	22 48	20 3 9.77	17 45 33.0	11.8	4.5	0.31	26	23 26	23 42 26.73	4 12 5.9	6.7	2.5	0.17
9	22 45	20 3 19.11	-17 56 56.3	11.6	4.4	0.31	27	23 29	23 49 6.72	-3 25 11.8	6.6	2.5	0.17
10	22 41	20 3 57.72	18 7 10.2	11.3	4.3	0.30	28	23 32	23 55 50.42	2 37 13.8	6.6	2.5	0.17
11	22 38	20 5 3.73	18 16 12.1	11.1	4.2	0.29	29	23 34	0 2 38.03	1 48 14.2	6.6	2.5	0.17
12	22 36	20 6 35.22	18 23 59.8	10.9	4.1	0.29	30	23 37	0 9 29.65	0 58 14.6	6.6	2.5	0.17
13	22 34	20 8 30.28	18 30 31.9	10.7	4.0	0.28	31	23 40	0 16 25.46	-0 7 17.5	6.6	2.5	0.17
14	22 32	20 10 47.05	-18 35 47.0	10.4	4.0	0.28	Apr. 1	23 43	0 23 25.54	+ 0 44 33.9	6.5	2.5	0.17
15	22 31	20 13 23.83	-18 39 44.2	10.2	3.9	0.28	2	23 47	0 30 30.05	+ 1 37 16.3	6.5	2.5	0.17

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Apr. 1	23 43	0 23 25.54	+ 0 44 33.9	6.5	2.5 0.17	May 17	0 59	4 36 32.98	+23 13 24.7	14.0	5.3 0.39
2	23 47	0 30 30.05	1 37 16.3	6.5	2.5 0.17	18	0 55	4 36 26.73	22 59 10.2	14.3	5.4 0.39
3	23 50	0 37 39.05	2 30 45.9	6.5	2.5 0.17	19	0 51	4 36 1.48	22 43 27.5	14.6	5.5 0.40
4	23 53	0 44 52.62	3 24 57.8	6.5	2.5 0.17	20	0 46	4 35 18.21	22 26 23.0	14.8	5.6 0.40
5	23 56	0 52 10.75	4 19 46.7	6.6	2.5 0.17	21	0 41	4 34 18.12	22 8 3.9	15.1	5.7 0.41
7	0 0	0 59 33.38	+ 5 15 6.6	6.6	2.5 0.17	22	0 36	4 33 2.64	+21 48 38.3	15.3	5.8 0.42
8	0 3	1 7 0.43	6 10 50.4	6.6	2.5 0.17	23	0 30	4 31 33.36	21 28 15.6	15.5	5.9 0.42
9	0 7	1 14 31.70	7 6 50.2	6.6	2.5 0.17	24	0 25	4 29 52.08	21 7 6.4	15.7	5.9 0.42
10	0 10	1 22 6.90	8 2 57.1	6.6	2.5 0.17	25	0 19	4 28 0.78	20 45 22.0	15.8	6.0 0.43
11	0 14	1 29 45.66	8 59 1.3	6.7	2.5 0.17	26	0 13	4 26 1.59	20 23 15.1	15.9	6.0 0.43
12	0 18	1 37 27.47	+ 9 54 52.1	6.7	2.6 0.18	27	0 7	4 23 56.72	+20 0 59.4	16.0	6.1 0.43
13	0 22	1 45 11.74	10 50 17.9	6.8	2.6 0.18	28	0 0	4 21 48.49	19 38 48.6	16.0	6.1 0.43
14	0 26	1 52 57.74	11 45 6.6	6.8	2.6 0.18	28	23 55	4 19 39.19	19 16 57.4	16.0	6.1 0.43
15	0 29	2 0 44.59	12 39 5.2	6.9	2.6 0.18	29	23 49	4 17 31.15	18 55 40.2	16.0	6.1 0.43
16	0 33	2 8 31.38	13 32 0.5	7.0	2.7 0.19	30	23 43	4 15 26.60	18 35 11.1	16.0	6.1 0.43
17	0 37	2 16 16.97	+14 23 40.2	7.1	2.7 0.19	31	23 37	4 13 27.66	+18 15 43.7	15.9	6.0 0.42
18	0 41	2 24 0.29	15 13 51.1	7.2	2.7 0.19	June 1	23 31	4 11 36.33	17 57 30.8	15.8	6.0 0.42
19	0 44	2 31 40.09	16 2 21.3	7.3	2.8 0.19	2	23 25	4 9 54.43	17 40 43.7	15.6	5.9 0.41
20	0 48	2 39 15.16	16 48 59.6	7.4	2.8 0.20	3	23 20	4 8 23.58	17 25 32.5	15.5	5.9 0.41
21	0 52	2 46 44.20	17 33 36.2	7.5	2.9 0.20	4	23 15	4 7 5.24	17 12 5.7	15.3	5.8 0.40
22	0 55	2 54 6.01	+18 16 2.1	7.7	2.9 0.20	5	23 10	4 6 0.62	+17 0 30.3	15.1	5.7 0.40
23	0 58	3 1 19.35	18 56 10.5	7.8	3.0 0.21	6	23 5	4 5 10.79	16 50 51.4	14.8	5.6 0.39
24	1 1	3 8 23.07	19 33 55.4	8.0	3.0 0.21	7	23 1	4 4 36.57	16 43 12.8	14.6	5.5 0.38
25	1 4	3 15 16.04	20 9 12.6	8.1	3.1 0.22	8	22 56	4 4 18.67	16 37 36.5	14.3	5.4 0.38
26	1 7	3 21 57.27	20 41 59.4	8.3	3.2 0.23	9	22 52	4 4 17.59	16 34 3.2	14.1	5.3 0.37
27	1 10	3 28 25.73	+21 12 14.0	8.5	3.2 0.23	10	22 49	4 4 33.70	+16 32 32.2	13.8	5.2 0.37
28	1 12	3 34 40.54	21 39 56.2	8.7	3.3 0.24	11	22 45	4 5 7.29	16 33 1.7	13.5	5.1 0.35
29	1 14	3 40 40.88	22 5 6.1	9.0	3.4 0.24	12	22 42	4 5 58.51	16 35 28.5	13.2	5.0 0.35
30	1 16	3 46 25.97	22 27 45.3	9.2	3.5 0.25	13	22 39	4 7 7.42	16 39 49.3	12.9	4.9 0.34
May 1	1 17	3 51 55.09	22 47 55.7	9.4	3.6 0.26	14	22 37	4 8 34.08	16 45 59.7	12.7	4.8 0.33
2	1 19	3 57 7.57	+23 5 39.6	9.7	3.7 0.27	15	22 35	4 10 18.41	+16 53 54.2	12.4	4.7 0.33
3	1 20	4 2 2.77	23 20 59.8	9.9	3.8 0.28	16	22 33	4 12 20.38	17 3 27.4	12.1	4.6 0.32
4	1 20	4 6 40.12	23 33 59.3	10.2	3.9 0.28	17	22 31	4 14 39.88	17 14 33.1	11.8	4.5 0.32
5	1 21	4 10 59.06	23 44 41.3	10.4	4.0 0.28	18	22 30	4 17 16.84	17 27 4.9	11.5	4.4 0.31
6	1 21	4 14 59.09	23 53 9.0	10.7	4.1 0.29	19	22 29	4 20 11.17	17 40 56.0	11.3	4.3 0.30
7	1 20	4 18 39.72	+23 59 25.4	11.0	4.2 0.30	20	22 28	4 23 22.77	+17 55 59.5	11.0	4.2 0.29
8	1 20	4 22 0.50	24 3 33.8	11.3	4.3 0.31	21	22 28	4 26 51.56	18 12 7.9	10.7	4.1 0.29
9	1 19	4 25 1.04	24 5 37.4	11.6	4.4 0.32	22	22 28	4 30 37.50	18 29 13.8	10.5	4.0 0.28
10	1 18	4 27 41.02	24 5 39.2	11.9	4.5 0.33	23	22 28	4 34 40.54	18 47 9.4	10.2	3.9 0.28
11	1 16	4 30 0.14	24 3 42.2	12.2	4.6 0.34	24	22 28	4 39 0.67	19 5 46.6	10.0	3.8 0.27
12	1 14	4 31 58.21	+23 59 49.6	12.5	4.7 0.34	25	22 29	4 43 37.88	+19 24 57.3	9.8	3.7 0.26
13	1 12	4 33 35.13	23 54 4.3	12.8	4.9 0.36	26	22 30	4 48 32.17	19 44 32.7	9.5	3.6 0.25
14	1 9	4 34 50.87	23 46 29.6	13.1	5.0 0.36	27	22 31	4 53 43.57	20 4 24.1	9.3	3.5 0.25
15	1 6	4 35 45.56	23 37 8.8	13.4	5.1 0.37	28	22 32	4 59 12.09	20 24 21.9	9.1	3.5 0.25
• 16	1 3	4 36 19.45	23 26 5.8	13.7	5.2 0.38	29	22 34	5 4 57.74	20 44 16.8	8.9	3.4 0.24
17	0 59	4 36 32.98	+23 13 24.7	14.0	5.3 0.39	30	22 36	5 11 0.50	+21 3 58.6	8.7	3.3 0.24
18	0 55	4 36 26.73	+22 59 10.2	14.3	5.4 0.39	July 1	22 39	5 17 20.35	+21 23 16.6	8.5	3.2 0.23

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	s		h m	h m s	° ' "	"	s
July 1	22 39	5 17 20.35	+21 23 16.6	8.5	3.2 0.23	Aug. 17	1 30	11 10 5.12	+5 25 29.6	7.6	2.9 0.20
2	22 41	5 23 57.17	21 42 0.0	8.3	3.2 0.23	18	1 31	11 15 17.00	4 43 31.6	7.7	2.9 0.20
3	22 44	5 30 50.80	21 59 57.5	8.2	3.1 0.22	19	1 32	11 20 22.18	4 1 52.7	7.7	2.9 0.20
4	22 48	5 38 0.99	22 16 57.3	8.0	3.0 0.22	20	1 33	11 25 20.70	3 20 35.6	7.8	3.0 0.20
5	22 51	5 45 27.41	22 32 47.3	7.9	3.0 0.22	21	1 34	11 30 12.58	2 39 43.1	7.9	3.0 0.20
6	22 55	5 53 9.56	+22 47 15.4	7.7	2.9 0.21	22	1 35	11 34 57.82	+1 59 17.9	8.0	3.0 0.20
7	22 59	6 1 6.81	23 0 9.3	7.6	2.9 0.21	23	1 35	11 39 36.42	1 19 23.1	8.1	3.1 0.20
8	23 3	6 9 18.36	23 11 17.0	7.5	2.8 0.20	24	1 36	11 44 8.32	0 40 1.4	8.2	3.1 0.20
9	23 7	6 17 43.24	23 20 26.6	7.3	2.8 0.20	25	1 37	11 48 33.41	+0 1 15.7	8.3	3.1 0.20
10	23 12	6 26 20.31	23 27 27.4	7.2	2.7 0.20	26	1 37	11 52 51.58	-0 36 50.7	8.4	3.2 0.21
11	23 17	6 35 8.20	+23 32 8.9	7.1	2.7 0.20	27	1 37	11 57 2.69	-1 14 14.6	8.5	3.2 0.22
12	23 22	6 44 5.46	23 34 22.9	7.0	2.7 0.20	28	1 37	12 1 6.51	1 50 52.7	8.7	3.3 0.22
13	23 27	6 53 10.42	23 34 1.8	6.9	2.6 0.19	29	1 37	12 5 2.84	2 26 41.4	8.8	3.3 0.23
14	23 32	7 2 21.35	23 31 0.0	6.9	2.6 0.19	30	1 37	12 8 51.38	3 1 36.9	8.9	3.4 0.23
15	23 38	7 11 36.44	23 25 14.1	6.8	2.6 0.19	31	1 37	12 12 31.78	3 35 35.2	9.0	3.4 0.23
16	23 43	7 20 53.83	+23 16 42.6	6.8	2.6 0.19	Sept. 1	1 36	12 16 3.68	-4 8 31.8	9.2	3.5 0.24
17	23 48	7 30 11.74	23 5 25.7	6.7	2.5 0.18	2	1 36	12 19 26.63	4 40 22.2	9.3	3.5 0.24
18	23 54	7 39 28.43	22 51 26.0	6.7	2.5 0.18	3	1 35	12 22 40.14	5 11 1.2	9.5	3.6 0.24
19	23 59	7 48 42.28	22 34 47.6	6.6	2.5 0.18	4	1 34	12 25 43.64	5 40 23.1	9.6	3.6 0.24
21	0 4	7 57 51.80	22 15 35.8	6.6	2.5 0.18	5	1 33	12 28 36.51	6 8 22.1	9.8	3.7 0.25
22	0 9	8 6 55.68	+21 53 57.7	6.6	2.5 0.18	6	1 32	12 31 18.05	-6 34 51.2	10.0	3.8 0.25
23	0 14	8 15 52.81	21 30 1.1	6.6	2.5 0.18	7	1 31	12 33 47.50	6 59 43.7	10.1	3.8 0.26
24	0 19	8 24 42.21	21 3 54.5	6.6	2.5 0.18	8	1 29	12 36 4.02	7 22 51.4	10.3	3.9 0.26
25	0 24	8 33 23.11	20 35 46.9	6.6	2.5 0.18	9	1 27	12 38 6.70	7 44 5.9	10.5	4.0 0.27
26	0 28	8 41 54.92	20 5 47.3	6.6	2.5 0.18	10	1 25	12 39 54.57	8 3 17.6	10.7	4.1 0.28
27	0 33	8 50 17.20	+19 34 5.1	6.6	2.5 0.18	11	1 22	12 41 26.58	-8 20 16.2	10.9	4.1 0.28
28	0 37	8 58 29.61	19 0 49.3	6.6	2.5 0.18	12	1 20	12 42 41.64	8 34 50.8	11.1	4.2 0.28
29	0 41	9 6 31.99	18 26 8.5	6.6	2.5 0.17	13	1 17	12 43 38.61	8 46 49.7	11.3	4.3 0.29
30	0 45	9 14 24.23	17 50 11.3	6.6	2.5 0.17	14	1 13	12 44 16.38	8 55 59.8	11.5	4.4 0.30
31	0 49	9 22 6.35	17 13 5.9	6.6	2.5 0.17	15	1 10	12 44 33.78	9 2 8.2	11.8	4.5 0.30
Aug. 1	0 52	9 29 38.41	+16 34 59.7	6.7	2.5 0.17	16	1 6	12 44 29.80	-9 5 1.1	12.0	4.5 0.30
2	0 56	9 37 0.53	15 55 59.9	6.7	2.5 0.17	17	1 1	12 44 3.46	9 4 24.7	12.2	4.6 0.31
3	0 59	9 44 12.87	15 16 13.4	6.7	2.6 0.18	18	0 57	12 43 13.93	9 0 5.5	12.4	4.7 0.31
4	1 2	9 51 15.65	14 35 46.3	6.8	2.6 0.18	19	0 52	12 42 0.90	8 51 51.3	12.6	4.8 0.32
5	1 5	9 58 9.07	13 54 44.6	6.8	2.6 0.18	20	0 46	12 40 24.03	8 39 31.5	12.8	4.9 0.33
6	1 8	10 4 53.37	+13 13 13.8	6.9	2.6 0.18	21	0 40	12 38 23.68	-8 22 58.3	13.0	4.9 0.33
7	1 10	10 11 28.82	12 31 19.0	6.9	2.6 0.18	22	0 34	12 36 0.70	8 2 8.2	13.2	5.0 0.34
8	1 13	10 17 55.62	11 49 4.7	7.0	2.6 0.18	23	0 27	12 33 16.58	7 37 3.1	13.3	5.1 0.34
9	1 15	10 24 14.04	11 6 36.0	7.0	2.7 0.18	24	0 20	12 30 13.56	7 7 51.5	13.4	5.1 0.34
10	1 18	10 30 24.32	10 23 56.5	7.1	2.7 0.18	25	0 13	12 26 54.66	6 34 49.6	13.5	5.1 0.34
11	1 20	10 36 26.66	+ 9 41 10.3	7.1	2.7 0.18	26	0 5	12 23 23.69	-5 58 23.1	13.5	5.1 0.34
12	1 22	10 42 21.30	8 58 21.3	7.2	2.7 0.18	26	23 58	12 19 45.19	5 19 6.2	13.5	5.1 0.34
13	1 23	10 48 8.41	8 15 32.8	7.3	2.8 0.19	27	23 50	12 16 4.36	4 37 42.1	13.5	5.1 0.34
14	1 25	10 53 48.20	7 32 48.2	7.3	2.8 0.19	28	23 43	12 12 26.84	3 55 1.4	13.4	5.1 0.34
15	1 27	10 59 20.81	6 50 10.8	7.4	2.8 0.19	29	23 35	12 8 58.48	3 12 0.6	13.2	5.0 0.34
16	1 28	11 4 46.42	+ 6 7 43.6	7.5	2.8 0.19	30	23 28	12 5 45.13	-2 29 38.7	13.0	4.9 0.33
17	1 30	11 10 5.12	+ 5 25 29.6	7.6	2.9 0.20	Oct. 1	23 21	12 2 52.35	-1 48 55.0	12.8	4.9 0.33

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.			
	h m	h m s	° ' "	"	s		h m	h m s	° ' "	"	s			
Oct.	1	23 21	12 2 52.35	- 1 48 55.0	12.8	4.9	0.33	Nov. 14	23 44	15 18 37.42	-18 27 49.6	6.1	2.3	0.16
	2	23 15	12 0 25.11	1 10 45.5	12.5	4.8	0.32	15	23 46	15 25 0.86	18 58 29.7	6.1	2.3	0.16
	3	23 9	11 58 27.67	0 36 0.8	12.2	4.7	0.32	16	23 49	15 31 25.58	19 28 13.4	6.1	2.3	0.16
	4	23 4	11 57 3.36	- 0 5 23.8	11.9	4.5	0.30	17	23 51	15 37 51.63	19 56 59.7	6.1	2.3	0.16
	5	22 59	11 56 14.55	+ 0 20 31.8	11.6	4.4	0.30	18	23 54	15 44 19.06	20 24 46.7	6.1	2.3	0.16
	6	22 55	11 56 2.62	+ 0 41 21.4	11.3	4.3	0.29	19	23 56	15 50 47.91	-20 51 33.2	6.1	2.3	0.16
	7	22 51	11 56 27.96	0 56 49.9	10.9	4.1	0.28	20	23 59	15 57 18.24	21 17 18.0	6.1	2.3	0.16
	8	22 49	11 57 30.11	1 6 51.2	10.6	4.0	0.27	22	0 1 16	3 50.07	21 41 59.4	6.1	2.3	0.17
	9	22 46	11 59 7.92	1 11 26.9	10.3	3.9	0.26	23	0 4 16	10 23.43	22 5 36.1	6.1	2.3	0.17
	10	22 45	12 1 19.58	1 10 45.0	10.0	3.8	0.25	24	0 6 16	16 58.30	22 28 6.7	6.1	2.3	0.17
	11	22 43	12 4 2.86	+ 1 4 59.0	9.6	3.7	0.25	25	0 9 16	23 34.73	-22 49 29.8	6.1	2.3	0.17
	12	22 43	12 7 15.17	0 54 26.7	9.3	3.6	0.25	26	0 12 16	30 12.69	23 9 44.0	6.1	2.3	0.17
	13	22 42	12 10 53.83	0 39 28.5	9.1	3.5	0.24	27	0 14 16	36 52.15	23 28 47.9	6.2	2.3	0.17
	14	22 42	12 14 56.04	+ 0 20 27.1	8.8	3.4	0.23	28	0 17 16	43 33.10	23 46 40.0	6.2	2.3	0.17
	15	22 43	12 19 19.04	- 0 2 13.9	8.6	3.3	0.22	29	0 20 16	50 15.46	24 3 19.0	6.2	2.3	0.17
Nov.	16	22 44	12 24 0.19	- 0 28 10.9	8.4	3.2	0.22	30	0 23 16	56 59.18	-24 18 43.6	6.2	2.4	0.18
	17	22 45	12 28 57.03	0 57 0.6	8.2	3.1	0.21	Dec. 1	0 26 17	3 44.17	24 32 52.1	6.3	2.4	0.18
	18	22 46	12 34 7.29	1 28 20.4	8.0	3.0	0.20	2	0 28 17	10 30.31	24 45 43.2	6.3	2.4	0.18
	19	22 47	12 39 28.85	2 1 49.2	7.8	3.0	0.20	3	0 31 17	17 17.48	24 57 15.4	6.3	2.4	0.18
	20	22 49	12 44 59.99	2 37 7.2	7.6	2.9	0.20	4	0 34 17	24 5.56	25 7 27.7	6.4	2.4	0.18
	21	22 50	12 50 39.08	- 3 13 56.1	7.5	2.8	0.19	5	0 37 17	30 54.31	-25 16 18.3	6.4	2.4	0.18
	22	22 52	12 56 24.74	3 51 59.4	7.3	2.8	0.19	6	0 40 17	37 43.58	25 23 46.1	6.5	2.5	0.19
	23	22 54	13 2 15.81	4 31 2.2	7.2	2.8	0.19	7	0 43 17	44 33.11	25 29 49.7	6.5	2.5	0.19
	24	22 56	13 8 11.30	5 10 50.9	7.1	2.7	0.18	8	0 46 17	51 22.63	25 34 28.1	6.6	2.5	0.19
	25	22 58	13 14 10.36	5 51 13.8	7.0	2.7	0.18	9	0 48 17	58 11.83	25 37 40.0	6.6	2.5	0.19
	26	23 0	13 20 12.35	- 6 31 59.9	6.9	2.6	0.18	10	0 51 18	5 0.37	-25 39 24.5	6.7	2.5	0.19
	27	23 2	13 26 16.68	7 13 0.0	6.8	2.6	0.18	11	0 54 18	11 47.83	25 39 40.6	6.7	2.5	0.19
	28	23 5	13 32 22.93	7 54 5.7	6.7	2.6	0.18	12	0 57 18	18 18 33.79	25 38 27.7	6.8	2.6	0.19
	29	23 7	13 38 30.72	8 35 9.6	6.7	2.5	0.17	13	1 0 18	25 17.74	25 35 45.1	6.9	2.6	0.19
	30	23 9	13 44 39.81	9 16 5.3	6.6	2.5	0.17	14	1 2 18	31 59.10	25 31 32.6	7.0	2.6	0.19
31	23 11	13 50 49.97	- 9 56 47.1	6.5	2.5	0.17	15	1 5 18	38 37.23	-25 25 49.9	7.1	2.7	0.20	
Dec.	1	23 13	13 57 1.06	10 37 10.0	6.5	2.5	0.17	16	1 8 18	45 11.41	25 18 37.7	7.2	2.7	0.20
	2	23 16	14 3 12.96	11 17 9.4	6.4	2.4	0.17	17	1 10 18	51 40.82	25 9 56.3	7.3	2.8	0.21
	3	23 18	14 9 25.63	11 56 41.3	6.4	2.4	0.16	18	1 13 18	58 4.54	24 59 46.5	7.4	2.8	0.21
	4	23 20	14 15 39.01	12 35 42.3	6.3	2.4	0.16	19	1 15 19	4 21.52	24 48 10.6	7.5	2.8	0.21
	5	23 22	14 21 53.11	-13 14 9.0	6.3	2.4	0.16	20	1 17 19	10 30.57	-24 35 10.2	7.6	2.9	0.21
	6	23 25	14 28 7.92	13 51 58.7	6.3	2.4	0.16	21	1 19 19	16 30.36	24 20 48.6	7.8	2.9	0.21
	7	23 27	14 34 23.47	14 29 8.7	6.2	2.4	0.16	22	1 21 19	22 19.39	24 5 9.4	7.9	3.0	0.22
	8	23 29	14 40 39.82	15 5 36.7	6.2	2.3	0.16	23	1 23 19	27 55.95	23 48 17.4	8.1	3.1	0.23
	9	23 32	14 46 57.00	15 41 20.4	6.2	2.3	0.16	24	1 24 19	33 18.13	23 30 18.5	8.2	3.1	0.23
	10	23 34	14 53 15.05	-16 16 18.0	6.1	2.3	0.16	25	1 25 19	38 23.84	-23 11 19.4	8.4	3.2	0.23
	11	23 36	14 59 34.06	16 50 27.5	6.1	2.3	0.16	26	1 26 19	43 10.59	22 51 29.1	8.6	3.3	0.24
	12	23 39	15 5 54.07	17 23 46.9	6.1	2.3	0.16	27	1 27 19	47 35.82	22 30 56.9	8.9	3.4	0.24
	13	23 41	15 12 15.17	17 56 14.8	6.1	2.3	0.16	28	1 27 19	51 36.67	22 9 54.7	9.1	3.5	0.25
	14	23 44	15 18 37.42	18 27 49.6	6.1	2.3	0.16	29	1 26 19	55 9.97	21 48 35.3	9.3	3.5	0.25
	15	23 46	15 25 0.86	-18 58 29.7	6.1	2.3	0.16	30	1 26 19	58 12.43	-21 27 13.7	9.6	3.6	0.26
16	23 49	15 31 25.58	-19 28 13.4	6.1	2.3	0.16	31	1 24 20	0 40.57	-21 6 5.8	9.9	3.7	0.26	

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Jan. 0	21 12	15 53 20.42	-15 57 46.3	20.9	19.9 1.39	Feb. 15	21 3	18 44 45.56	-20 18 18.6	11.5	11.0 0.78
1	21 11	15 55 40.78	16 2 22.1	20.5	19.6 1.36	16	21 3	18 49 21.62	20 17 28.4	11.4	10.9 0.77
2	21 9	15 58 6.75	16 7 26.3	20.2	19.3 1.34	17	21 4	18 53 58.66	20 16 8.6	11.3	10.8 0.76
3	21 8	16 0 38.17	16 12 56.7	19.9	19.0 1.32	18	21 5	18 58 36.61	20 14 18.9	11.2	10.7 0.76
4	21 7	16 3 14.87	16 18 51.2	19.6	18.7 1.30	19	21 5	19 3 15.41	20 11 58.9	11.0	10.5 0.75
5	21 5	16 5 56.67	-16 25 7.6	19.3	18.4 1.28	20	21 6	19 7 54.98	-20 9 8.3	10.9	10.4 0.75
6	21 4	16 8 43.41	16 31 43.9	19.0	18.1 1.26	21	21 7	19 12 35.26	20 5 46.9	10.8	10.3 0.74
7	21 3	16 11 34.93	16 38 38.0	18.7	17.8 1.24	22	21 7	19 17 16.19	20 1 54.4	10.7	10.3 0.73
8	21 2	16 14 31.09	16 45 47.8	18.4	17.6 1.22	23	21 8	19 21 57.71	19 57 30.6	10.6	10.2 0.72
9	21 1	16 17 31.74	16 53 11.4	18.1	17.3 1.21	24	21 9	19 26 39.77	19 52 35.4	10.5	10.1 0.72
10	21 0	16 20 36.72	-17 0 46.9	17.9	17.1 1.19	25	21 10	19 31 22.30	-19 47 8.6	10.4	10.0 0.71
11	21 0	16 23 45.88	17 8 32.4	17.6	16.8 1.17	26	21 11	19 36 5.25	19 41 10.2	10.4	9.9 0.70
12	20 59	16 26 59.10	17 16 26.0	17.3	16.6 1.15	27	21 11	19 40 48.56	19 34 40.0	10.3	9.8 0.69
13	20 58	16 30 16.23	17 24 26.0	17.1	16.3 1.14	28	21 12	19 45 32.18	19 27 37.9	10.2	9.7 0.69
14	20 58	16 33 37.15	17 32 30.6	16.9	16.1 1.12	Mar. 1	21 13	19 50 16.07	19 20 4.0	10.1	9.6 0.68
15	20 57	16 37 1.75	-17 40 38.2	16.6	15.9 1.11	2	21 14	19 55 0.18	-19 11 58.3	10.0	9.6 0.68
16	20 57	16 40 29.89	17 48 47.2	16.4	15.7 1.10	3	21 14	19 59 44.14	19 3 20.9	9.9	9.5 0.67
17	20 56	16 44 1.47	17 56 56.0	16.2	15.4 1.09	4	21 15	20 4 28.82	18 54 11.7	9.8	9.4 0.66
18	20 56	16 47 36.38	18 5 3.0	16.0	15.2 1.07	5	21 16	20 9 13.27	18 44 30.9	9.8	9.3 0.65
19	20 56	16 51 14.52	18 13 6.8	15.7	15.0 1.06	6	21 17	20 13 57.73	18 34 18.8	9.7	9.2 0.65
20	20 55	16 54 55.80	-18 21 5.9	15.5	14.8 1.04	7	21 18	20 18 42.16	-18 23 35.5	9.6	9.2 0.64
21	20 55	16 58 40.12	18 28 58.9	15.3	14.6 1.03	8	21 18	20 23 26.51	18 12 21.0	9.5	9.1 0.64
22	20 55	17 2 27.40	18 36 44.5	15.1	14.4 1.02	9	21 19	20 28 10.74	18 0 35.7	9.4	9.0 0.63
23	20 55	17 6 17.54	18 44 21.4	14.9	14.3 1.01	10	21 20	20 32 54.81	17 48 19.9	9.4	8.9 0.63
24	20 55	17 10 10.47	18 51 48.3	14.7	14.1 0.99	11	21 21	20 37 38.67	17 35 33.8	9.3	8.9 0.62
25	20 55	17 14 6.11	-18 59 4.0	14.5	13.9 0.98	12	21 22	20 42 22.27	-17 22 17.6	9.2	8.8 0.62
26	20 55	17 18 4.36	19 6 7.2	14.4	13.7 0.97	13	21 22	20 47 5.57	17 8 31.7	9.2	8.7 0.61
27	20 55	17 22 5.15	19 12 56.8	14.2	13.6 0.96	14	21 23	20 51 48.55	16 54 16.5	9.1	8.7 0.61
28	20 55	17 26 8.41	19 19 31.6	14.0	13.4 0.95	15	21 24	20 56 31.17	16 39 32.4	9.0	8.6 0.60
29	20 55	17 30 14.07	19 25 50.7	13.8	13.2 0.94	16	21 25	21 1 13.39	16 24 19.6	8.9	8.5 0.59
30	20 55	17 34 22.06	-19 31 52.9	13.7	13.1 0.93	17	21 25	21 5 55.20	-16 8 38.6	8.9	8.5 0.59
31	20 56	17 38 32.30	19 37 37.2	13.5	12.9 0.92	18	21 26	21 10 36.56	15 52 29.9	8.8	8.4 0.59
Feb. 1	20 56	17 42 44.73	19 43 2.7	13.4	12.8 0.91	19	21 27	21 15 17.45	15 35 53.8	8.7	8.4 0.58
2	20 56	17 46 59.27	19 48 8.5	13.2	12.6 0.90	20	21 28	21 19 57.85	15 18 50.8	8.7	8.3 0.57
3	20 56	17 51 15.83	19 52 53.6	13.1	12.5 0.89	21	21 28	21 24 37.75	15 1 21.3	8.6	8.2 0.57
4	20 57	17 55 34.35	-19 57 17.1	12.9	12.3 0.88	22	21 29	21 29 17.12	-14 43 25.9	8.6	8.2 0.56
5	20 57	17 59 54.77	20 1 18.2	12.8	12.2 0.87	23	21 30	21 33 55.96	14 25 5.0	8.5	8.1 0.56
6	20 58	18 4 17.00	20 4 56.0	12.6	12.1 0.86	24	21 30	21 38 34.25	14 6 19.2	8.4	8.1 0.56
7	20 58	18 8 40.95	20 8 9.9	12.5	11.9 0.85	25	21 31	21 43 11.98	13 47 8.8	8.4	8.0 0.55
8	20 59	18 13 6.55	20 10 59.1	12.4	11.8 0.84	26	21 32	21 47 49.15	13 27 34.4	8.3	8.0 0.55
9	20 59	18 17 33.74	-20 13 22.8	12.2	11.7 0.83	27	21 33	21 52 25.76	-13 7 36.6	8.3	7.9 0.54
10	21 0	18 22 2.42	20 15 20.6	12.1	11.6 0.82	28	21 33	21 57 1.81	12 47 16.0	8.2	7.9 0.54
11	21 0	18 26 32.51	20 16 51.7	12.0	11.4 0.81	29	21 34	22 1 37.30	12 26 32.9	8.2	7.8 0.53
12	21 1	18 31 3.94	20 17 55.5	11.8	11.3 0.80	30	21 35	22 6 12.23	12 5 28.0	8.1	7.8 0.53
13	21 1	18 35 36.65	20 18 31.6	11.7	11.2 0.79	31	21 35	22 10 46.60	11 44 1.8	8.1	7.7 0.53
14	21 2	18 40 10.55	-20 18 39.5	11.6	11.1 0.79	Apr. 1	21 36	22 15 20.43	-11 22 14.9	8.0	7.7 0.52
15	21 3	18 44 45.56	-20 18 18.6	11.5	11.0 0.78	2	21 36	22 19 53.73	-11 0 7.8	8.0	7.6 0.52

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Apr. 1	21 36	22 15 20.43	-11 22 14.9	8.0	7.7 0.52	May 17	21 59	1 40 33.88	+ 8 32 41.2	6.3	6.0 0.41
2	21 36	22 19 53.73	11 0 7.8	8.0	7.6 0.52	18	22 0	1 45 5.82	8 58 47.6	6.3	6.0 0.41
3	21 37	22 24 26.50	10 37 41.2	7.9	7.6 0.51	19	22 1	1 49 38.43	9 24 43.5	6.3	6.0 0.41
4	21 37	22 28 58.74	10 14 55.7	7.9	7.5 0.51	20	22 1	1 54 11.75	9 50 28.4	6.2	6.0 0.40
5	21 38	22 33 30.47	9 51 51.7	7.8	7.5 0.51	21	22 2	1 58 45.81	10 16 1.5	6.2	5.9 0.40
6	21 39	22 38 1.69	- 9 28 30.0	7.8	7.4 0.50	22	22 3	2 3 20.63	+10 41 22.1	6.2	5.9 0.40
7	21 39	22 42 32.43	9 45 1.1	7.7	7.4 0.50	23	22 3	2 7 56.24	11 6 29.5	6.2	5.9 0.40
8	21 40	22 47 2.68	8 40 55.7	7.7	7.3 0.49	24	22 4	2 12 32.68	11 31 23.1	6.1	5.9 0.40
9	21 40	22 51 32.47	8 16 44.3	7.6	7.3 0.49	25	22 5	2 17 9.98	11 56 2.1	6.1	5.9 0.40
10	21 41	22 56 1.81	7 52 17.7	7.6	7.2 0.49	26	22 5	2 21 48.16	12 20 25.9	6.1	5.8 0.40
11	21 41	23 0 30.70	- 7 27 36.5	7.5	7.2 0.48	27	22 6	2 26 27.24	+12 44 33.8	6.1	5.8 0.40
12	21 42	23 4 59.17	7 2 41.4	7.5	7.2 0.48	28	22 7	2 31 7.25	13 8 25.0	6.1	5.8 0.40
13	21 42	23 9 27.23	6 37 32.9	7.5	7.1 0.48	29	22 7	2 35 48.23	13 31 58.9	6.0	5.8 0.40
14	21 43	23 13 54.90	6 12 11.7	7.4	7.1 0.47	30	22 8	2 40 30.21	13 55 14.9	6.0	5.7 0.40
15	21 43	23 18 22.20	5 46 38.5	7.4	7.0 0.47	31	22 9	2 45 13.18	14 18 12.1	6.0	5.7 0.39
16	21 44	23 22 49.17	- 5 20 53.9	7.3	7.0 0.47	June 1	22 10	2 49 57.18	+14 40 50.0	6.0	5.7 0.39
17	21 44	23 27 15.81	4 54 58.6	7.3	7.0 0.47	2	22 10	2 54 42.24	15 3 7.7	6.0	5.7 0.39
18	21 45	23 31 42.15	4 28 53.1	7.3	6.9 0.46	3	22 11	2 59 28.35	15 25 4.6	5.9	5.7 0.39
19	21 45	23 36 8.20	4 2 38.1	7.2	6.9 0.46	4	22 12	3 4 15.53	15 46 40.1	5.9	5.7 0.39
20	21 46	23 40 34.01	3 36 14.4	7.2	6.9 0.46	5	22 13	3 9 3.81	16 7 53.3	5.9	5.6 0.39
21	21 46	23 44 59.60	- 3 9 12.5	7.1	6.8 0.46	6	22 14	3 13 53.19	+16 28 43.5	5.9	5.6 0.39
22	21 47	23 49 25.00	2 43 3.0	7.1	6.8 0.45	7	22 15	3 18 43.68	16 49 10.1	5.9	5.6 0.39
23	21 47	23 53 50.23	2 16 16.7	7.1	6.8 0.45	8	22 16	3 23 35.28	17 9 12.4	5.8	5.6 0.39
24	21 48	23 58 15.32	1 49 24.1	7.0	6.7 0.45	9	22 17	3 28 27.99	17 28 49.7	5.8	5.6 0.39
25	21 48	0 2 40.32	1 22 25.9	7.0	6.7 0.45	10	22 18	3 33 21.83	17 48 1.3	5.8	5.5 0.39
26	21 49	0 7 5.26	- 0 55 22.7	7.0	6.6 0.44	11	22 19	3 38 16.79	+18 6 46.5	5.8	5.5 0.39
27	21 49	0 11 30.16	0 28 15.3	6.9	6.6 0.44	12	22 20	3 43 12.87	18 25 4.5	5.8	5.5 0.39
28	21 50	0 15 55.06	- 0 1 4.2	6.9	6.6 0.44	13	22 21	3 48 10.06	18 42 54.8	5.7	5.5 0.39
29	21 50	0 20 20.00	+ 0 26 10.0	6.9	6.6 0.44	14	22 22	3 53 8.37	19 0 16.7	5.7	5.5 0.39
30	21 51	0 24 45.02	0 53 26.7	6.8	6.5 0.44	15	22 23	3 58 7.78	19 17 9.4	5.7	5.5 0.39
May 1	21 51	0 29 10.15	+ 1 20 45.2	6.8	6.5 0.43	16	22 24	4 3 8.27	+19 33 32.4	5.7	5.4 0.38
2	21 52	0 33 35.41	1 48 4.8	6.8	6.5 0.43	17	22 25	4 8 9.84	19 49 24.9	5.7	5.4 0.38
3	21 52	0 38 0.85	2 15 24.9	6.7	6.4 0.43	18	22 26	4 13 12.49	20 4 46.5	5.7	5.4 0.38
4	21 53	0 42 26.51	2 42 44.8	6.7	6.4 0.43	19	22 27	4 18 16.19	20 19 36.5	5.6	5.4 0.38
5	21 53	0 46 52.42	3 10 3.9	6.7	6.4 0.43	20	22 28	4 23 20.92	20 33 54.2	5.6	5.4 0.38
6	21 54	0 51 18.60	+ 3 37 21.5	6.6	6.3 0.42	21	22 29	4 28 26.67	+20 47 39.0	5.6	5.4 0.38
7	21 55	0 55 45.09	4 4 36.9	6.6	6.3 0.42	22	22 30	4 33 33.41	21 0 50.5	5.6	5.4 0.38
8	21 55	1 0 11.92	4 31 49.4	6.6	6.3 0.42	23	22 32	4 38 41.11	21 13 27.9	5.6	5.3 0.38
9	21 55	1 4 39.12	4 58 58.4	6.5	6.2 0.42	24	22 33	4 43 49.77	21 25 30.8	5.6	5.3 0.38
10	21 56	1 9 6.73	5 26 3.2	6.5	6.2 0.42	25	22 34	4 48 59.36	21 36 58.7	5.6	5.3 0.38
11	21 56	1 13 34.78	+ 5 53 3.1	6.5	6.2 0.42	26	22 35	4 54 9.84	+21 47 51.0	5.5	5.3 0.38
12	21 57	1 18 3.29	6 19 57.4	6.5	6.2 0.41	27	22 37	4 59 21.19	21 58 7.3	5.5	5.3 0.38
13	21 57	1 22 32.29	6 46 45.5	6.4	6.1 0.41	28	22 38	5 4 33.38	22 7 47.0	5.5	5.3 0.38
14	21 58	1 27 1.82	7 13 26.5	6.4	6.1 0.41	29	22 39	5 9 46.38	22 16 49.7	5.5	5.3 0.38
15	21 58	1 31 31.91	7 39 59.9	6.4	6.1 0.41	30	22 40	5 15 0.14	22 25 15.0	5.5	5.3 0.38
16	21 59	1 36 2.59	+ 8 6 25.1	6.3	6.1 0.41	July 1	22 42	5 20 14.62	+22 33 2.5	5.5	5.2 0.38
17	21 59	1 40 33.88	+ 8 32 41.2	6.3	6.0 0.41	2	22 43	5 25 29.79	+22 40 11.7	5.5	5.2 0.38

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
July 1	22 42	5 20 14.62	+22 33 2.5	5.5	5.2	0.38	Aug. 16	23 40	9 20 15.69	+16 44 10.0	5.1	4.9	0.34
2	22 43	5 25 29.79	22 40 11.7	5.5	5.2	0.38	17	23 41	9 25 11.95	16 22 40.7	5.1	4.9	0.34
3	22 44	5 30 45.61	22 46 42.3	5.5	5.2	0.38	18	23 42	9 30 7.16	16 0 44.0	5.1	4.9	0.34
4	22 46	5 36 2.02	22 52 34.0	5.4	5.2	0.38	19	23 43	9 35 1.31	15 38 20.5	5.1	4.9	0.34
5	22 47	5 41 18.97	22 57 46.5	5.4	5.2	0.38	20	23 44	9 39 54.42	15 15 31.0	5.1	4.9	0.34
6	22 48	5 46 36.43	+23 2 19.4	5.4	5.2	0.38	21	23 45	9 44 46.49	+14 52 16.1	5.1	4.9	0.34
7	22 50	5 51 54.34	23 6 12.5	5.4	5.2	0.38	22	23 46	9 49 37.55	14 28 36.5	5.1	4.9	0.34
8	22 51	5 57 12.64	23 9 25.6	5.4	5.2	0.37	23	23 47	9 54 27.62	14 4 32.9	5.1	4.9	0.34
9	22 52	6 2 31.29	23 11 58.3	5.4	5.1	0.37	24	23 48	9 59 16.69	13 40 5.9	5.1	4.9	0.34
10	22 54	6 7 50.23	23 13 50.5	5.4	5.1	0.37	25	23 48	10 4 4.79	13 15 16.4	5.1	4.9	0.34
11	22 55	6 13 9.39	+23 15 2.2	5.4	5.1	0.37	26	23 49	10 8 51.95	+12 50 5.0	5.1	4.9	0.33
12	22 56	6 18 28.73	23 15 33.2	5.4	5.1	0.37	27	23 50	10 13 38.19	12 24 32.3	5.1	4.9	0.33
13	22 58	6 23 48.18	23 15 23.3	5.3	5.1	0.37	28	23 51	10 18 23.53	11 58 39.2	5.1	4.9	0.33
14	22 59	6 29 7.70	23 14 32.4	5.3	5.1	0.37	29	23 52	10 22 7.99	11 32 26.4	5.1	4.9	0.33
15	23 1	6 34 27.24	23 13 0.6	5.3	5.1	0.37	30	23 52	10 27 51.60	11 5 54.5	5.1	4.9	0.33
16	23 2	6 39 46.71	+23 10 47.9	5.3	5.1	0.37	31	23 53	10 32 34.38	+10 39 4.2	5.1	4.9	0.33
17	23 3	6 45 6.07	23 7 54.3	5.3	5.1	0.37	Sept. 1	23 54	10 37 16.37	10 11 56.4	5.1	4.9	0.33
18	23 5	6 50 25.27	23 4 19.7	5.3	5.1	0.37	2	23 55	10 41 57.60	9 44 31.6	5.1	4.9	0.33
19	23 6	6 55 44.25	23 0 4.3	5.3	5.1	0.37	3	23 55	10 46 38.08	9 16 50.7	5.1	4.9	0.33
20	23 7	7 1 2.96	22 55 8.3	5.3	5.1	0.37	4	23 56	10 51 17.85	8 48 54.4	5.1	4.9	0.33
21	23 9	7 6 21.34	+22 49 31.7	5.3	5.0	0.37	5	23 57	10 55 56.96	+ 8 20 43.4	5.1	4.9	0.33
22	23 10	7 11 39.35	22 43 14.8	5.3	5.0	0.36	6	23 58	11 0 35.43	7 52 18.4	5.1	4.9	0.33
23	23 11	7 16 56.94	22 36 17.7	5.3	5.0	0.36	7	23 58	11 5 13.28	7 23 40.2	5.1	4.9	0.33
24	23 13	7 22 11.06	22 28 40.7	5.3	5.0	0.36	8	23 59	11 9 50.55	6 54 49.5	5.1	4.9	0.33
25	23 14	7 27 30.67	22 20 23.9	5.2	5.0	0.36	9	24 0	11 14 27.28	6 25 47.0	5.1	4.9	0.33
26	23 15	7 32 46.72	+22 11 27.7	5.2	5.0	0.36	11	0 0 11 19 3.50	+ 5 56 33.5	5.1	4.9	0.33	
27	23 17	7 38 2.18	22 1 52.4	5.2	5.0	0.36	12	0 1 11 23 39.24	5 27 9.8	5.1	4.9	0.33	
28	23 18	7 43 17.00	21 51 38.2	5.2	5.0	0.36	13	0 2 11 28 14.54	4 57 36.5	5.1	4.9	0.33	
29	23 19	7 48 31.13	21 40 45.5	5.2	5.0	0.36	14	0 2 11 32 49.43	4 27 54.5	5.1	4.9	0.33	
30	23 21	7 53 44.55	21 29 14.7	5.2	5.0	0.36	15	0 3 11 37 23.96	3 58 4.5	5.1	4.9	0.33	
31	23 22	7 58 57.22	+21 17 6.3	5.2	5.0	0.36	16	0 3 11 41 58.15	+ 3 28 7.1	5.1	4.9	0.33	
Aug. 1	23 23	8 4 9.10	21 4 20.6	5.2	5.0	0.36	17	0 4 11 46 32.05	2 58 3.1	5.1	4.9	0.33	
2	23 24	8 9 20.17	20 50 58.0	5.2	5.0	0.35	18	0 5 11 51 5.70	2 27 53.2	5.1	4.9	0.33	
3	23 26	8 14 30.38	20 36 59.2	5.2	5.0	0.35	19	0 5 11 55 39.15	1 57 38.3	5.1	4.9	0.33	
4	23 27	8 19 39.71	20 22 24.5	5.2	5.0	0.35	20	0 6 12 0 12.43	1 27 18.9	5.1	4.9	0.33	
5	23 28	8 24 48.15	+20 7 14.4	5.2	4.9	0.35	21	0 7 12 4 45.58	+ 0 56 55.9	5.1	4.9	0.33	
6	23 29	8 29 55.66	19 51 29.4	5.2	4.9	0.35	22	0 7 12 9 18.65	+ 0 26 30.0	5.1	4.9	0.33	
7	23 30	8 35 2.21	19 35 10.1	5.2	4.9	0.35	23	0 8 12 13 51.69	- 0 3 58.1	5.1	4.9	0.33	
8	23 32	8 40 7.80	19 18 17.0	5.2	4.9	0.35	24	0 8 12 18 24.73	0 34 27.6	5.1	4.9	0.33	
9	23 33	8 45 12.40	19 0 50.8	5.2	4.9	0.35	25	0 9 12 22 57.82	1 4 57.9	5.1	4.9	0.33	
10	23 34	8 50 15.98	+18 42 52.0	5.2	4.9	0.35	26	0 10 12 27 31.00	- 1 35 28.3	5.1	4.9	0.33	
11	23 35	8 55 18.55	18 24 21.2	5.1	4.9	0.35	27	0 10 12 32 4.32	2 5 57.9	5.1	4.9	0.33	
12	23 36	9 0 20.09	18 5 19.1	5.1	4.9	0.34	28	0 11 12 36 37.84	2 36 26.0	5.1	4.9	0.33	
13	23 37	9 5 20.58	17 45 46.3	5.1	4.9	0.34	29	0 11 12 41 11.58	3 6 52.0	5.1	4.9	0.33	
14	23 38	9 10 20.01	17 25 43.4	5.1	4.9	0.34	30	0 12 12 45 45.59	3 37 15.0	5.1	4.9	0.33	
15	23 39	9 15 18.38	+17 5 11.1	5.1	4.9	0.34	Oct. 1	0 13 12 50 19.91	- 4 7 34.3	5.1	4.9	0.33	
16	23 40	9 20 15.69	+16 44 10.0	5.1	4.9	0.34	2	0 13 12 54 54.59	- 4 37 49.3	5.2	4.9	0.33	

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Oct. 1	0 13	12 50 19.91	- 4 7 34.3	5.1	4.9 0.33	Nov. 15	0 55	16 30 36.22	-22 18 29.7	5.5	5.2 0.38
2	0 13	12 54 54.59	4 37 49.3	5.2	4.9 0.33	16	0 57	16 35 55.64	22 31 58.5	5.5	5.2 0.38
3	0 14	12 59 29.67	5 7 59.1	5.2	4.9 0.33	17	0 58	16 41 16.05	22 44 47.9	5.5	5.2 0.38
4	0 15	13 4 5.20	5 38 2.9	5.2	4.9 0.33	18	1 0	16 46 37.41	22 56 57.2	5.5	5.3 0.38
5	0 15	13 8 41.21	6 8 0.0	5.2	4.9 0.33	19	1 1	16 51 59.69	23 8 25.9	5.5	5.3 0.38
6	0 16	13 13 17.74	- 6 37 49.6	5.2	4.9 0.33	20	1 2	16 57 22.84	-23 19 13.5	5.5	5.3 0.38
7	0 17	13 17 54.84	7 7 31.1	5.2	4.9 0.33	21	1 4	17 2 46.81	23 29 19.5	5.5	5.3 0.38
8	0 17	13 22 32.54	7 37 3.6	5.2	4.9 0.33	22	1 5	17 8 11.56	23 38 43.3	5.5	5.3 0.38
9	0 18	13 27 10.88	8 6 26.4	5.2	4.9 0.33	23	1 7	17 13 37.03	23 47 24.7	5.5	5.3 0.39
10	0 19	13 31 49.90	8 35 38.6	5.2	5.0 0.33	24	1 8	17 19 3.17	23 55 23.2	5.6	5.3 0.39
11	0 19	13 36 29.64	- 9 4 39.5	5.2	5.0 0.34	25	1 10	17 24 29.94	-24 2 38.3	5.6	5.3 0.39
12	0 20	13 41 10.12	9 33 28.2	5.2	5.0 0.34	26	1 11	17 29 57.27	24 9 9.7	5.6	5.3 0.39
13	0 21	13 45 51.38	10 2 4.1	5.2	5.0 0.34	27	1 13	17 35 25.10	24 14 57.1	5.6	5.3 0.39
14	0 22	13 50 33.45	10 30 26.2	5.2	5.0 0.34	28	1 14	17 40 53.38	24 20 0.2	5.6	5.4 0.39
15	0 22	13 55 16.38	10 58 33.8	5.2	5.0 0.34	29	1 16	17 46 22.05	24 24 18.8	5.6	5.4 0.39
16	0 23	14 0 0.19	-11 26 26.1	5.2	5.0 0.34	30	1 17	17 51 51.04	-24 27 52.6	5.6	5.4 0.40
17	0 24	14 4 44.91	11 54 2.3	5.2	5.0 0.34	Dec. 1	1 19	17 57 20.29	24 30 41.4	5.6	5.4 0.40
18	0 25	14 9 30.57	12 21 21.6	5.2	5.0 0.34	2	1 21	18 2 49.73	24 32 45.1	5.7	5.4 0.40
19	0 26	14 14 17.21	12 48 23.2	5.2	5.0 0.34	3	1 22	18 8 19.29	24 34 3.6	5.7	5.4 0.40
20	0 26	14 19 4.86	13 15 6.3	5.2	5.0 0.34	4	1 24	18 13 48.90	24 34 36.8	5.7	5.4 0.40
21	0 27	14 23 53.56	-13 41 30.1	5.2	5.0 0.34	5	1 25	18 19 18.51	-24 34 24.6	5.7	5.5 0.40
22	0 28	14 28 43.32	14 7 33.8	5.3	5.0 0.35	6	1 27	18 24 48.04	24 33 27.0	5.7	5.5 0.40
23	0 29	14 33 34.16	14 33 16.7	5.3	5.0 0.35	7	1 28	18 30 17.42	24 31 43.9	5.7	5.5 0.40
24	0 30	14 38 26.12	14 58 38.0	5.3	5.0 0.35	8	1 30	18 35 46.58	24 29 15.6	5.7	5.5 0.40
25	0 31	14 43 19.22	15 23 36.7	5.3	5.0 0.35	9	1 31	18 41 15.44	24 26 2.2	5.8	5.5 0.40
26	0 32	14 48 13.49	-15 48 12.2	5.3	5.1 0.35	10	1 33	18 46 43.94	-24 22 3.7	5.8	5.5 0.41
27	0 33	14 53 8.94	16 12 23.6	5.3	5.1 0.35	11	1 34	18 52 11.99	24 17 20.2	5.8	5.5 0.41
28	0 34	14 58 5.58	16 36 10.1	5.3	5.1 0.35	12	1 36	18 57 39.54	24 11 52.0	5.8	5.5 0.41
29	0 35	15 3 3.45	16 59 31.0	5.3	5.1 0.35	13	1 37	19 3 6.52	24 5 39.4	5.8	5.6 0.41
30	0 36	15 8 2.55	17 22 25.4	5.3	5.1 0.35	14	1 39	19 8 32.87	23 58 42.6	5.8	5.6 0.41
31	0 37	15 13 2.89	-17 44 52.6	5.3	5.1 0.36	15	1 40	19 13 58.52	-23 51 1.9	5.8	5.6 0.41
Nov. 1	0 38	15 18 4.49	18 6 51.8	5.3	5.1 0.36	16	1 42	19 19 23.41	23 42 37.7	5.9	5.6 0.41
2	0 39	15 23 7.35	18 28 22.1	5.3	5.1 0.36	17	1 43	19 24 47.49	23 33 30.3	5.9	5.6 0.41
3	0 40	15 28 11.47	18 49 22.9	5.3	5.1 0.36	18	1 45	19 30 10.70	23 23 40.2	5.9	5.6 0.41
4	0 42	15 33 16.84	19 9 53.3	5.4	5.1 0.36	19	1 46	19 35 33.00	23 13 7.7	5.9	5.7 0.41
5	0 43	15 38 23.48	-19 29 52.6	5.4	5.1 0.36	20	1 48	19 40 54.33	-23 1 53.3	5.9	5.7 0.41
6	0 44	15 43 31.37	19 49 19.9	5.4	5.1 0.36	21	1 49	19 46 14.63	22 49 57.4	5.9	5.7 0.41
7	0 45	15 48 40.50	20 8 14.6	5.4	5.1 0.37	22	1 50	19 51 33.87	22 37 20.6	6.0	5.7 0.41
8	0 46	15 53 50.87	20 26 35.9	5.4	5.2 0.37	23	1 52	19 56 52.00	22 24 3.5	6.0	5.7 0.41
9	0 48	15 59 2.46	20 44 23.1	5.4	5.2 0.37	24	1 53	20 2 8.99	22 10 6.6	6.0	5.7 0.41
10	0 49	16 4 15.24	-21 1 35.4	5.4	5.2 0.37	25	1 54	20 7 24.81	-21 55 30.5	6.0	5.7 0.41
11	0 50	16 9 29.19	21 18 12.1	5.4	5.2 0.37	26	1 56	20 12 39.42	21 40 15.7	6.0	5.8 0.41
12	0 51	16 14 44.29	21 34 12.6	5.4	5.2 0.37	27	1 57	20 17 52.79	21 24 22.8	6.1	5.8 0.41
13	0 53	16 20 0.52	21 49 36.1	5.4	5.2 0.37	28	1 58	20 23 4.89	21 7 52.5	6.1	5.8 0.41
14	0 54	16 25 17.84	22 4 22.0	5.5	5.2 0.37	29	1 59	20 28 15.70	20 50 45.6	6.1	5.8 0.42
15	0 55	16 30 36.22	-22 18 29.7	5.5	5.2 0.38	30	2 1	20 33 25.21	-20 33 2.6	6.1	5.8 0.42
16	0 57	16 35 55.64	-22 31 58.5	5.5	5.2 0.38	31	2 2	20 38 33.38	-20 14 44.2	6.1	5.9 0.42

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidian. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidian. S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	" s		h m s	h m s	° ' "	"	" s
Jan. 9	19 34	14 50 15.34	-15 11 23.1	1.5	15.9 1.17	Feb. 24	16 50	15 6 53.50	-16 14 53.0	1.7	18.2 1.35
10	19 31	14 50 49.80	15 13 48.0	1.5	15.9 1.17	25	16 46	15 6 59.57	16 15 7.2	1.7	18.2 1.35
11	19 27	14 51 23.80	15 16 10.3	1.5	16.0 1.18	26	16 42	15 7 4.90	16 15 18.3	1.8	18.3 1.36
12	19 24	14 51 57.34	15 18 30.0	1.5	16.0 1.18	27	16 38	15 7 9.48	16 15 26.5	1.8	18.3 1.36
13	19 21	14 52 30.40	15 20 47.2	1.5	16.1 1.18	28	16 34	15 7 13.33	16 15 31.7	1.8	18.4 1.36
14	19 17	14 53 2.97	-15 23 1.7	1.5	16.1 1.19	Mar. 1	16 31	15 7 16.43	-16 15 33.9	1.8	18.5 1.37
15	19 14	14 53 35.05	15 25 13.5	1.5	16.1 1.19	2	16 27	15 7 18.78	16 15 33.1	1.8	18.5 1.37
16	19 10	14 54 6.63	15 27 22.7	1.5	16.2 1.20	3	16 23	15 7 20.39	16 15 29.2	1.8	18.6 1.38
17	19 7	14 54 37.69	15 29 29.4	1.6	16.2 1.20	4	16 19	15 7 21.25	16 15 22.4	1.8	18.6 1.38
18	19 4	14 55 8.24	15 31 33.3	1.6	16.3 1.20	5	16 15	15 7 21.35	16 15 12.5	1.8	18.7 1.39
19	19 0	14 55 38.26	-15 33 34.5	1.6	16.3 1.21	6	16 11	15 7 20.71	-16 14 59.7	1.8	18.7 1.39
20	18 57	14 56 7.75	15 35 33.1	1.6	16.4 1.21	7	16 7	15 7 19.32	16 14 43.9	1.8	18.8 1.40
21	18 53	14 56 36.70	15 37 29.0	1.6	16.4 1.22	8	16 3	15 7 17.18	16 14 25.0	1.8	18.9 1.40
22	18 50	14 57 5.11	15 39 22.1	1.6	16.5 1.22	9	15 59	15 7 14.28	16 14 3.2	1.8	18.9 1.40
23	18 46	14 57 32.98	15 41 12.4	1.6	16.5 1.22	10	15 55	15 7 10.63	16 13 38.5	1.8	19.0 1.41
24	18 43	14 58 0.28	-15 43 0.0	1.6	16.5 1.23	11	15 51	15 7 6.23	-16 13 10.7	1.8	19.0 1.41
25	18 39	14 58 27.00	15 44 44.8	1.6	16.6 1.23	12	15 47	15 7 1.07	16 12 40.0	1.8	19.1 1.41
26	18 36	14 58 53.16	15 46 26.9	1.6	16.6 1.24	13	15 43	15 6 55.16	16 12 6.2	1.8	19.1 1.42
27	18 32	14 59 18.75	15 48 6.2	1.6	16.7 1.24	14	15 39	15 6 48.51	16 11 29.5	1.8	19.2 1.42
28	18 29	14 59 43.74	15 49 42.7	1.6	16.7 1.24	15	15 35	15 6 41.13	16 10 50.0	1.8	19.2 1.42
29	18 25	15 0 8.14	-15 51 16.3	1.6	16.8 1.25	16	15 31	15 6 33.00	-16 10 7.5	1.8	19.3 1.43
30	18 22	15 0 31.96	15 52 47.1	1.6	16.8 1.25	17	15 27	15 6 24.14	16 9 22.1	1.8	19.3 1.43
31	18 18	15 0 55.17	15 54 15.2	1.6	16.9 1.26	18	15 23	15 6 14.55	16 8 33.8	1.9	19.4 1.43
Feb. 1	18 15	15 1 17.75	15 55 40.5	1.6	16.9 1.26	19	15 19	15 6 4.24	16 7 42.7	1.9	19.4 1.44
2	18 11	15 1 39.72	15 57 2.9	1.6	17.0 1.26	20	15 15	15 5 53.21	16 6 48.8	1.9	19.5 1.44
3	18 8	15 2 1.07	-15 58 22.4	1.6	17.0 1.27	21	15 10	15 5 41.48	-16 5 52.0	1.9	19.5 1.44
4	18 4	15 2 21.79	15 59 39.0	1.6	17.1 1.27	22	15 6	15 5 29.04	16 4 52.4	1.9	19.6 1.45
5	18 0	15 2 41.87	16 0 52.8	1.6	17.1 1.27	23	15 2	15 5 15.90	-16 3 50.1	1.9	19.6 1.45
6	17 57	15 3 1.31	16 2 3.7	1.6	17.2 1.28	24	14 58	15 5 2.08	16 2 45.1	1.9	19.7 1.45
7	17 53	15 3 20.09	16 3 11.7	1.7	17.2 1.28	25	14 54	15 4 47.59	16 1 37.4	1.9	19.7 1.46
8	17 50	15 3 38.21	-16 4 16.7	1.7	17.3 1.28	26	14 50	15 4 32.42	-16 0 27.0	1.9	19.8 1.46
9	17 46	15 3 55.67	16 5 18.8	1.7	17.3 1.29	27	14 45	15 4 16.60	15 59 14.1	1.9	19.8 1.46
10	17 42	15 4 12.46	16 6 18.0	1.7	17.4 1.29	28	14 41	15 4 0.13	15 57 58.5	1.9	19.9 1.47
11	17 39	15 4 28.56	16 7 14.3	1.7	17.5 1.30	29	14 37	15 3 43.03	15 56 40.4	1.9	19.9 1.47
12	17 35	15 4 43.97	16 8 7.6	1.7	17.5 1.30	30	14 33	15 3 25.29	15 55 19.8	1.9	20.0 1.48
13	17 31	15 4 58.69	-16 8 57.9	1.7	17.6 1.31	31	14 28	15 3 6.93	-15 53 56.7	1.9	20.0 1.48
14	17 28	15 5 12.71	16 9 45.1	1.7	17.6 1.31	Apr. 1	14 24	15 2 47.97	15 52 31.2	1.9	20.0 1.48
15	17 24	15 5 26.02	16 10 29.4	1.7	17.7 1.31	2	14 20	15 2 28.41	15 51 3.3	1.9	20.1 1.49
16	17 20	15 5 38.63	16 11 10.8	1.7	17.7 1.32	3	14 16	15 2 8.26	15 49 33.0	1.9	20.1 1.49
17	17 16	15 5 50.52	16 11 49.2	1.7	17.8 1.32	4	14 11	15 1 47.54	15 48 0.5	1.9	20.2 1.49
18	17 13	15 6 1.69	-16 12 24.5	1.7	17.8 1.33	5	14 7	15 1 26.26	-15 46 25.6	1.9	20.2 1.50
19	17 9	15 6 12.14	16 12 56.8	1.7	17.9 1.33	6	14 3	15 1 4.42	15 44 48.5	1.9	20.2 1.50
20	17 5	15 6 21.87	16 13 26.0	1.7	18.0 1.33	7	13 59	15 0 42.04	15 43 9.2	1.9	20.3 1.50
21	17 1	15 6 30.88	16 13 52.3	1.7	18.0 1.34	8	13 54	15 0 19.13	15 41 27.8	1.9	20.3 1.50
22	16 57	15 6 39.15	16 14 15.5	1.7	18.1 1.34	9	13 50	14 59 55.71	15 39 44.4	1.9	20.4 1.51
23	16 54	15 6 46.69	-16 14 35.8	1.7	18.1 1.35	10	13 46	14 59 31.80	-15 37 59.0	2.0	20.4 1.51
24	16 50	15 6 53.50	-16 14 53.0	1.7	18.2 1.35	11	13 41	14 59 7.41	-15 36 11.6	2.0	20.4 1.51

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Apr. 11	13 41	14 59 7.41	-15 36 11.6	2.0	20.4 1.51	May 27	10 19	14 37 20.14	-14 1 34.8	2.0	20.5 1.51
12	13 37	14 58 42.56	15 34 22.4	2.0	20.5 1.51	28	10 14	14 36 55.17	13 59 48.7	2.0	20.5 1.51
13	13 33	14 58 17.27	15 32 31.3	2.0	20.5 1.52	29	10 10	14 36 30.64	13 58 4.7	2.0	20.5 1.51
14	13 28	14 57 51.55	15 30 38.4	2.0	20.5 1.52	30	10 6	14 36 6.56	13 56 22.9	2.0	20.5 1.51
15	13 24	14 57 25.41	15 28 43.8	2.0	20.5 1.52	31	10 1	14 35 42.94	13 54 43.5	2.0	20.4 1.50
16	13 20	14 56 58.88	-15 26 47.6	2.0	20.6 1.52	June 1	9 57	14 35 19.80	-13 53 6.3	2.0	20.4 1.50
17	13 15	14 56 31.98	15 24 49.9	2.0	20.6 1.52	2	9 53	14 34 57.15	13 51 31.4	2.0	20.4 1.50
18	13 11	14 56 4.73	15 22 50.7	2.0	20.6 1.52	3	9 48	14 34 35.00	13 49 59.1	1.9	20.3 1.50
19	13 6	14 55 37.14	15 20 50.1	2.0	20.7 1.52	4	9 44	14 34 13.36	13 48 29.3	1.9	20.3 1.49
20	13 2	14 55 9.24	15 18 48.2	2.0	20.7 1.52	5	9 40	14 33 52.26	13 47 2.1	1.9	20.3 1.49
21	12 58	14 54 41.05	-15 16 45.1	2.0	20.7 1.53	6	9 36	14 33 31.70	-13 45 37.5	1.9	20.2 1.49
22	12 53	14 54 12.58	15 14 40.9	2.0	20.7 1.53	7	9 31	14 33 11.68	13 44 15.7	1.9	20.2 1.48
23	12 49	14 53 43.86	15 12 35.6	2.0	20.7 1.53	8	9 27	14 32 52.23	13 42 56.6	1.9	20.1 1.48
24	12 44	14 53 14.91	15 10 29.3	2.0	20.8 1.53	9	9 23	14 32 33.36	13 41 40.3	1.9	20.1 1.48
25	12 40	14 52 45.74	15 8 22.0	2.0	20.8 1.53	10	9 19	14 32 15.08	13 40 27.0	1.9	20.1 1.47
26	12 35	14 52 16.38	-15 6 14.0	2.0	20.8 1.53	11	9 14	14 31 57.40	-13 39 16.6	1.9	20.0 1.47
27	12 31	14 51 46.85	15 4 5.3	2.0	20.8 1.53	12	9 10	14 31 40.32	13 38 9.1	1.9	20.0 1.47
28	12 27	14 51 17.16	15 1 55.9	2.0	20.8 1.53	13	9 6	14 31 23.85	13 37 4.7	1.9	19.9 1.46
29	12 22	14 50 47.33	14 59 46.0	2.0	20.8 1.53	14	9 2	14 31 8.01	13 36 3.3	1.9	19.9 1.46
30	12 18	14 50 17.39	14 57 35.7	2.0	20.8 1.53	15	8 58	14 30 52.80	13 35 5.1	1.9	19.8 1.46
May 1	12 13	14 49 47.36	-14 55 25.0	2.0	20.8 1.54	16	8 53	14 30 38.23	-13 34 10.1	1.9	19.8 1.46
2	12 9	14 49 17.26	14 53 14.0	2.0	20.8 1.54	17	8 49	14 30 24.31	13 33 18.2	1.9	19.7 1.45
3	12 5	14 48 47.11	14 51 2.8	2.0	20.8 1.54	18	8 45	14 30 11.05	13 32 29.5	1.9	19.7 1.45
4	12 0	14 48 16.92	14 48 51.5	2.0	20.8 1.54	19	8 41	14 29 58.44	13 31 44.1	1.9	19.6 1.45
5	11 56	14 47 46.72	14 46 40.2	2.0	20.8 1.54	20	8 37	14 29 46.50	13 31 2.1	1.9	19.6 1.44
6	11 51	14 47 16.53	-14 44 28.9	2.0	20.8 1.54	21	8 33	14 29 35.24	-13 30 23.4	1.9	19.5 1.44
7	11 47	14 46 46.35	14 42 17.8	2.0	20.8 1.54	22	8 29	14 29 24.65	13 29 47.9	1.9	19.5 1.44
8	11 42	14 46 16.21	14 40 6.9	2.0	20.8 1.54	23	8 25	14 29 14.74	13 29 15.7	1.9	19.4 1.43
9	11 38	14 45 46.15	14 37 56.4	2.0	20.8 1.54	24	8 20	14 29 5.51	13 28 47.0	1.9	19.4 1.43
10	11 33	14 45 16.19	14 35 46.3	2.0	20.8 1.54	25	8 16	14 28 56.96	13 28 21.7	1.8	19.3 1.43
11	11 29	14 44 46.33	-14 33 36.7	2.0	20.8 1.54	26	8 12	14 28 49.10	-13 27 59.8	1.8	19.3 1.42
12	11 25	14 44 16.60	14 31 27.7	2.0	20.8 1.53	27	8 8	14 28 41.92	13 27 41.3	1.8	19.2 1.42
13	11 20	14 43 47.02	14 29 19.5	2.0	20.8 1.53	28	8 4	14 28 35.44	13 27 26.2	1.8	19.2 1.42
14	11 16	14 43 17.62	14 27 12.2	2.0	20.8 1.53	29	8 0	14 28 29.65	13 27 14.6	1.8	19.1 1.41
15	11 11	14 42 48.41	14 25 5.8	2.0	20.8 1.53	30	7 56	14 28 24.55	13 27 6.4	1.8	19.1 1.41
16	11 7	14 42 19.41	-14 23 0.4	2.0	20.8 1.53	July 1	7 52	14 28 20.14	-13 27 1.6	1.8	19.0 1.41
17	11 3	14 41 50.65	14 20 56.1	2.0	20.8 1.53	2	7 48	14 28 16.42	13 27 0.2	1.8	19.0 1.40
18	10 58	14 41 22.14	14 18 53.0	2.0	20.7 1.53	3	7 44	14 28 13.40	13 27 2.2	1.8	18.9 1.40
19	10 54	14 40 53.91	14 16 51.3	2.0	20.7 1.52	4	7 40	14 28 11.08	13 27 7.7	1.8	18.9 1.39
20	10 49	14 40 25.98	14 14 50.9	2.0	20.7 1.52	5	7 36	14 28 9.46	13 27 16.6	1.8	18.8 1.39
21	10 45	14 39 58.36	-14 12 52.0	2.0	20.7 1.52	6	7 32	14 28 8.54	-13 27 29.0	1.8	18.8 1.39
22	10 41	14 39 31.07	14 10 54.6	2.0	20.7 1.52	7	7 28	14 28 8.32	13 27 44.8	1.8	18.7 1.38
23	10 36	14 39 4.12	14 8 59.0	2.0	20.6 1.52	8	7 24	14 28 8.81	13 28 4.0	1.8	18.7 1.38
24	10 32	14 38 37.54	14 7 5.2	2.0	20.6 1.52	9	7 21	14 28 10.00	13 28 26.6	1.8	18.6 1.38
25	10 27	14 38 11.34	14 5 13.1	2.0	20.6 1.52	10	7 17	14 28 11.88	13 28 52.7	1.8	18.6 1.37
26	10 23	14 37 45.54	-14 3 23.0	2.0	20.6 1.51	11	7 13	14 28 14.46	-13 29 22.2	1.8	18.5 1.37
27	10 19	14 37 20.14	-14 1 34.8	2.0	20.5 1.51	12	7 9	14 28 17.75	-13 29 55.0	1.8	18.5 1.36

Stellar magnitude at opposition in May, 1923, -2.0.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m	h m s	° ' "	"	"	s
Jan. 0	18 35	13 15 19.69	-5 20 58.1	0.9	7.7	0.57	Feb. 15	15 36	13 17 15.53	-5 19 10.6	1.0	8.3	0.62
1	18 31	13 15 30.82	5 21 48.5	0.9	7.7	0.57	16	15 32	13 17 8.94	5 18 14.6	1.0	8.3	0.62
2	18 27	13 15 41.60	5 22 36.8	0.9	7.7	0.57	17	15 28	13 17 1.99	5 17 16.6	1.0	8.3	0.62
3	18 24	13 15 52.02	5 23 22.9	0.9	7.7	0.58	18	15 24	13 16 54.69	5 16 16.6	1.0	8.3	0.62
4	18 20	13 16 2.07	5 24 6.6	0.9	7.7	0.58	19	15 20	13 16 47.04	5 15 14.6	1.0	8.3	0.62
5	18 16	13 16 11.75	-5 24 48.0	0.9	7.7	0.58	20	15 16	13 16 39.03	-5 14 10.6	1.0	8.3	0.62
6	18 12	13 16 21.08	5 25 27.0	0.9	7.7	0.58	21	15 12	13 16 30.66	5 13 4.6	1.0	8.4	0.62
7	18 9	13 16 30.04	5 26 3.7	0.9	7.8	0.58	22	15 8	13 16 21.96	5 11 56.8	1.0	8.4	0.62
8	18 5	13 16 38.61	5 26 38.1	0.9	7.8	0.58	23	15 3	13 16 12.92	5 10 47.2	1.0	8.4	0.63
9	18 1	13 16 46.81	5 27 10.1	0.9	7.8	0.58	24	14 59	13 16 3.56	5 9 35.7	1.0	8.4	0.63
10	17 57	13 16 54.63	-5 27 39.7	0.9	7.8	0.58	25	14 55	13 15 53.87	-5 8 22.5	1.0	8.4	0.63
11	17 53	13 17 2.08	5 28 6.9	0.9	7.8	0.58	26	14 51	13 15 43.85	5 7 7.5	1.0	8.4	0.63
12	17 50	13 17 9.15	5 28 31.8	0.9	7.8	0.58	27	14 47	13 15 33.52	5 5 50.8	1.0	8.4	0.63
13	17 46	13 17 15.83	5 28 54.3	0.9	7.8	0.59	28	14 43	13 15 22.89	5 4 32.5	1.0	8.4	0.63
14	17 42	13 17 22.11	5 29 14.4	0.9	7.9	0.59	Mar. 1	14 39	13 15 11.94	5 3 12.5	1.0	8.4	0.63
15	17 38	13 17 28.01	-5 29 32.1	0.9	7.9	0.59	2	14 35	13 15 0.69	-5 1 50.9	1.0	8.4	0.63
16	17 34	13 17 33.52	5 29 47.4	0.9	7.9	0.59	3	14 31	13 14 49.16	5 0 27.8	1.0	8.5	0.63
17	17 30	13 17 38.63	5 30 0.3	0.9	7.9	0.59	4	14 27	13 14 37.33	4 59 3.1	1.0	8.5	0.63
18	17 27	13 17 43.36	5 30 10.7	0.9	7.9	0.59	5	14 22	13 14 25.22	4 57 36.9	1.0	8.5	0.63
19	17 23	13 17 47.69	5 30 18.8	0.9	7.9	0.59	6	14 18	13 14 12.84	4 56 9.3	1.0	8.5	0.63
20	17 19	13 17 51.62	-5 30 24.5	0.9	7.9	0.59	7	14 14	13 14 0.18	-4 54 40.3	1.0	8.5	0.63
21	17 15	13 17 55.15	5 30 27.8	0.9	7.9	0.59	8	14 10	13 13 47.25	4 53 10.0	1.0	8.5	0.63
22	17 11	13 17 58.28	5 30 28.6	0.9	8.0	0.59	9	14 6	13 13 34.07	4 51 38.3	1.0	8.5	0.63
23	17 7	13 18 1.02	5 30 27.1	0.9	8.0	0.60	10	14 2	13 13 20.64	4 50 5.3	1.0	8.5	0.64
24	17 3	13 18 3.36	5 30 23.3	0.9	8.0	0.60	11	13 58	13 13 6.97	4 48 31.1	1.0	8.5	0.64
25	16 59	13 18 5.31	-5 30 17.0	0.9	8.0	0.60	12	13 53	13 12 53.05	-4 46 55.8	1.0	8.5	0.64
26	16 55	13 18 6.86	5 30 8.2	0.9	8.0	0.60	13	13 49	13 12 38.90	4 45 19.4	1.0	8.5	0.64
27	16 52	13 18 8.01	5 29 57.1	0.9	8.0	0.60	14	13 45	13 12 24.54	4 43 41.9	1.0	8.5	0.64
28	16 48	13 18 8.77	5 29 43.7	0.9	8.1	0.60	15	13 41	13 12 9.96	4 42 3.4	1.0	8.5	0.64
29	16 44	13 18 9.13	5 29 28.0	1.0	8.1	0.60	16	13 37	13 11 55.17	4 40 23.9	1.0	8.5	0.64
30	16 40	13 18 9.10	-5 29 9.9	1.0	8.1	0.60	17	13 32	13 11 40.19	-4 38 43.4	1.0	8.5	0.64
31	16 36	13 18 8.67	5 28 49.4	1.0	8.1	0.60	18	13 28	13 11 25.02	4 37 2.2	1.0	8.6	0.64
Feb. 1	16 32	13 18 7.85	5 28 26.7	1.0	8.1	0.60	19	13 24	13 11 9.66	4 35 20.2	1.0	8.6	0.64
2	16 28	13 18 6.63	5 28 1.7	1.0	8.1	0.61	20	13 20	13 10 54.13	4 33 37.3	1.0	8.6	0.64
3	16 24	13 18 5.02	5 27 34.3	1.0	8.1	0.61	21	13 16	13 10 38.45	4 32 53.7	1.0	8.6	0.64
4	16 20	13 18 3.02	-5 27 4.6	1.0	8.1	0.61	22	13 12	13 10 22.61	-4 30 9.5	1.0	8.6	0.64
5	16 16	13 18 0.63	5 26 32.6	1.0	8.2	0.61	23	13 7	13 10 6.62	4 28 24.8	1.0	8.6	0.64
6	16 12	13 17 57.85	5 25 58.3	1.0	8.2	0.61	24	13 3	13 9 50.50	4 26 39.5	1.0	8.6	0.64
7	16 8	13 17 54.69	5 25 21.8	1.0	8.2	0.61	25	12 59	13 9 34.25	4 24 53.8	1.0	8.6	0.64
8	16 4	13 17 51.13	5 24 43.0	1.0	8.2	0.61	26	12 55	13 9 17.89	4 23 7.8	1.0	8.6	0.64
9	16 0	13 17 47.18	-5 24 2.1	1.0	8.2	0.61	27	12 51	13 9 1.41	-4 21 21.3	1.0	8.6	0.64
10	15 56	13 17 42.85	5 23 19.0	1.0	8.2	0.61	28	12 46	13 8 44.83	4 19 34.4	1.0	8.6	0.64
11	15 52	13 17 38.14	5 22 33.6	1.0	8.2	0.61	29	12 42	13 8 28.17	4 17 47.4	1.0	8.6	0.64
12	15 48	13 17 33.05	5 21 46.0	1.0	8.3	0.62	30	12 38	13 8 11.42	4 16 0.2	1.0	8.6	0.64
13	15 44	13 17 27.58	5 20 56.4	1.0	8.3	0.62	31	12 34	13 7 54.60	4 14 12.9	1.0	8.6	0.64
14	15 40	13 17 21.74	-5 20 4.6	1.0	8.3	0.62	Apr. 1	12 29	13 7 37.71	-4 12 25.4	1.0	8.6	0.64
15	15 36	13 17 15.53	-5 19 10.6	1.0	8.3	0.62	2	12 25	13 7 20.76	-4 10 38.0	1.0	8.6	0.64

Stellar magnitude at opposition in April, 1923, 0.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semi-diam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Polar Semi-diam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Apr. 1	12 29	13 7 37.71	-4 12 25.4	1.0	8.6 0.64	May 17	9 17	12 56 0.35	-3 4 5.1	1.0	8.4 0.63
2	12 25	13 7 20.76	4 10 38.0	1.0	8.6 0.64	18	9 13	12 55 49.86	3 3 11.8	1.0	8.4 0.62
3	12 21	13 7 3.76	4 8 50.6	1.0	8.6 0.64	19	9 9	12 55 39.68	3 2 20.5	1.0	8.4 0.62
4	12 17	13 6 46.72	4 7 3.3	1.0	8.6 0.64	20	9 5	12 55 29.80	3 1 31.2	1.0	8.4 0.62
5	12 13	13 6 29.66	4 5 16.1	1.0	8.6 0.64	21	9 1	12 55 20.23	3 0 44.2	1.0	8.3 0.62
6	12 8	13 6 12.57	-4 3 29.1	1.0	8.6 0.64	22	8 57	12 55 10.99	-2 59 59.4	1.0	8.3 0.62
7	12 4	13 5 55.47	4 1 42.4	1.0	8.6 0.64	23	8 52	12 55 2.06	2 59 16.8	1.0	8.3 0.62
8	12 0	13 5 38.36	3 59 56.0	1.0	8.6 0.64	24	8 48	12 54 53.44	2 58 36.3	1.0	8.3 0.62
9	11 56	13 5 21.25	3 58 9.9	1.0	8.6 0.64	25	8 44	12 54 45.16	2 57 58.0	1.0	8.3 0.62
10	11 52	13 5 4.16	3 56 24.3	1.0	8.6 0.64	26	8 40	12 54 37.21	2 57 22.0	1.0	8.3 0.62
11	11 47	13 4 47.09	-3 54 39.1	1.0	8.6 0.64	27	8 36	12 54 29.59	-2 56 48.3	1.0	8.3 0.62
12	11 43	13 4 30.06	3 52 54.4	1.0	8.6 0.64	28	8 32	12 54 22.30	2 56 16.8	1.0	8.3 0.62
13	11 39	13 4 13.07	3 51 10.4	1.0	8.6 0.64	29	8 28	12 54 15.35	2 55 47.5	1.0	8.2 0.62
14	11 35	13 3 56.12	3 49 27.0	1.0	8.6 0.64	30	8 24	12 54 8.73	2 55 20.5	1.0	8.2 0.61
15	11 30	13 3 39.24	3 47 44.3	1.0	8.6 0.64	31	8 20	12 54 2.45	2 54 55.9	1.0	8.2 0.61
16	11 26	13 3 22.43	-3 46 2.4	1.0	8.6 0.64	June 1	8 16	12 53 56.52	-2 54 33.5	1.0	8.2 0.61
17	11 22	13 3 5.71	3 44 21.3	1.0	8.6 0.64	2	8 12	12 53 50.94	2 54 13.5	1.0	8.2 0.61
18	11 18	13 2 49.07	3 42 41.1	1.0	8.6 0.64	3	8 8	12 53 45.71	2 53 55.7	1.0	8.2 0.61
19	11 14	13 2 32.52	3 41 1.9	1.0	8.6 0.64	4	8 4	12 53 40.82	2 53 40.3	1.0	8.2 0.61
20	11 9	13 2 16.08	3 39 23.6	1.0	8.6 0.64	5	8 0	12 53 36.29	2 53 27.2	1.0	8.2 0.61
21	11 5	13 1 59.76	-3 37 46.3	1.0	8.6 0.64	6	7 56	12 53 32.11	-2 53 16.5	1.0	8.1 0.61
22	11 1	13 1 43.55	3 36 10.1	1.0	8.6 0.64	7	7 52	12 53 28.29	2 53 8.1	1.0	8.1 0.61
23	10 57	13 1 27.48	3 34 35.0	1.0	8.6 0.64	8	7 48	12 53 24.83	2 53 2.1	1.0	8.1 0.61
24	10 53	13 1 11.56	3 33 1.2	1.0	8.6 0.64	9	7 44	12 53 21.73	2 52 58.5	1.0	8.1 0.60
25	10 48	13 0 55.78	3 31 28.6	1.0	8.6 0.64	10	7 40	12 53 18.99	2 52 57.2	1.0	8.1 0.60
26	10 44	13 0 40.16	-3 29 57.2	1.0	8.6 0.64	11	7 36	12 53 16.62	-2 52 58.3	1.0	8.1 0.60
27	10 40	13 0 24.71	3 28 27.1	1.0	8.6 0.64	12	7 32	12 53 14.61	2 53 1.7	1.0	8.1 0.60
28	10 36	13 0 9.42	3 26 58.5	1.0	8.6 0.64	13	7 28	12 53 12.97	2 53 7.5	1.0	8.0 0.60
29	10 32	12 59 54.31	3 25 31.3	1.0	8.5 0.64	14	7 24	12 53 11.70	2 53 15.7	1.0	8.0 0.60
30	10 28	12 59 39.39	3 24 5.5	1.0	8.5 0.64	15	7 20	12 53 10.80	2 53 26.3	0.9	8.0 0.60
May 1	10 23	12 59 24.66	-3 22 41.2	1.0	8.5 0.64	16	7 16	12 53 10.26	-2 53 39.2	0.9	8.0 0.60
2	10 19	12 59 10.13	3 21 18.4	1.0	8.5 0.64	17	7 12	12 53 10.08	2 53 54.5	0.9	8.0 0.60
3	10 15	12 58 55.80	3 19 57.2	1.0	8.5 0.64	18	7 8	12 53 10.28	2 54 12.2	0.9	8.0 0.60
4	10 11	12 58 41.68	3 18 37.6	1.0	8.5 0.63	19	7 4	12 53 10.85	2 54 32.2	0.9	8.0 0.59
5	10 7	12 58 27.77	3 17 19.6	1.0	8.5 0.63	20	7 1	12 53 11.80	2 54 54.6	0.9	8.0 0.59
6	10 2	12 58 14.09	-3 16 3.3	1.0	8.5 0.63	21	6 57	12 53 13.11	-2 55 19.3	0.9	7.9 0.59
7	9 58	12 58 0.64	3 14 48.7	1.0	8.5 0.63	22	6 53	12 53 14.79	2 55 46.3	0.9	7.9 0.59
8	9 54	12 57 47.43	3 13 35.8	1.0	8.5 0.63	23	6 49	12 53 16.83	2 56 15.7	0.9	7.9 0.59
9	9 50	12 57 34.47	3 12 24.7	1.0	8.5 0.63	24	6 45	12 53 19.24	2 56 47.4	0.9	7.9 0.59
10	9 46	12 57 21.76	3 11 15.5	1.0	8.5 0.63	25	6 41	12 53 22.01	2 57 21.4	0.9	7.9 0.59
11	9 42	12 57 9.31	-3 10 8.2	1.0	8.4 0.63	26	6 37	12 53 25.15	-2 57 57.6	0.9	7.9 0.59
12	9 38	12 56 57.12	3 9 2.8	1.0	8.4 0.63	27	6 33	12 53 28.65	2 58 36.1	0.9	7.9 0.59
13	9 33	12 56 45.20	3 7 59.3	1.0	8.4 0.63	28	6 29	12 53 32.51	2 59 16.9	0.9	7.8 0.59
14	9 29	12 56 33.56	3 6 57.7	1.0	8.4 0.63	29	6 26	12 53 36.72	3 0 0.0	0.9	7.8 0.58
15	9 25	12 56 22.20	3 5 58.1	1.0	8.4 0.63	30	6 22	12 53 41.30	3 0 45.2	0.9	7.8 0.58
16	9 21	12 56 11.13	-3 5 0.6	1.0	8.4 0.63	July 1	6 18	12 53 46.24	-3 1 32.7	0.9	7.8 0.58
17	9 17	12 56 0.35	-3 4 5.1	1.0	8.4 0.63	2	6 14	12 53 51.53	-3 2 22.4	0.9	7.8 0.58

Stellar magnitude at opposition in April, 1923, 0.5.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m s	h m s	° ' "	"	"	s		h m s	h m s	° ' "	"	"	s
July 1	16 38	23 15 19.46	-5 39 28.3	0.4	1.7	0.12	Aug. 16	13 33	23 11 25.59	-6 5 30.4	0.5	1.8	0.12
2	16 34	23 15 17.80	5 39 41.2	0.4	1.7	0.12	17	13 29	23 11 17.65	6 6 21.3	0.5	1.8	0.12
3	16 30	23 15 15.97	5 39 55.2	0.4	1.7	0.12	18	13 25	23 11 9.64	6 7 12.7	0.5	1.8	0.12
4	16 26	23 15 13.96	5 40 10.2	0.4	1.7	0.12	19	13 21	23 11 1.55	6 8 4.6	0.5	1.8	0.12
5	16 22	23 15 11.79	5 40 26.3	0.4	1.7	0.12	20	13 17	23 10 53.40	6 8 56.8	0.5	1.8	0.12
6	16 18	23 15 9.45	-5 40 43.5	0.4	1.7	0.12	21	13 13	23 10 45.18	-6 9 49.5	0.5	1.8	0.12
7	16 14	23 15 6.94	5 41 1.7	0.4	1.7	0.12	22	13 9	23 10 36.88	6 10 42.5	0.5	1.8	0.12
8	16 10	23 15 4.25	5 41 21.0	0.4	1.7	0.12	23	13 5	23 10 28.53	6 11 35.8	0.5	1.8	0.12
9	16 6	23 15 1.40	5 41 41.3	0.4	1.8	0.12	24	13 0	23 10 20.12	6 12 29.4	0.5	1.8	0.12
10	16 2	23 14 58.39	5 42 2.7	0.4	1.8	0.12	25	12 56	23 10 11.66	6 13 23.3	0.5	1.8	0.12
11	15 58	23 14 55.21	-5 42 25.1	0.4	1.8	0.12	26	12 52	23 10 3.14	-6 14 17.5	0.5	1.8	0.12
12	15 54	23 14 51.86	5 42 48.5	0.4	1.8	0.12	27	12 48	23 9 54.57	6 15 11.9	0.5	1.8	0.12
13	15 50	23 14 48.35	5 43 12.9	0.4	1.8	0.12	28	12 44	23 9 45.97	6 16 6.5	0.5	1.8	0.12
14	15 46	23 14 44.68	5 43 38.4	0.5	1.8	0.12	29	12 40	23 9 37.32	6 17 1.3	0.5	1.8	0.12
15	15 42	23 14 40.84	5 44 4.8	0.5	1.8	0.12	30	12 36	23 9 28.62	6 17 56.3	0.5	1.8	0.12
16	15 38	23 14 36.84	-5 44 32.2	0.5	1.8	0.12	31	12 32	23 9 19.89	-6 18 51.6	0.5	1.8	0.12
17	15 34	23 14 32.70	5 45 0.6	0.5	1.8	0.12	Sept. 1	12 28	23 9 11.13	6 19 47.0	0.5	1.8	0.12
18	15 30	23 14 28.40	5 45 29.9	0.5	1.8	0.12	2	12 24	23 9 2.34	6 20 42.5	0.5	1.8	0.12
19	15 26	23 14 23.94	5 46 0.1	0.5	1.8	0.12	3	12 20	23 8 53.53	6 21 38.0	0.5	1.8	0.12
20	15 22	23 14 19.33	5 46 31.3	0.5	1.8	0.12	4	12 16	23 8 44.69	6 22 33.7	0.5	1.8	0.12
21	15 18	23 14 14.58	-5 47 3.4	0.5	1.8	0.12	5	12 12	23 8 35.83	-6 23 29.3	0.5	1.8	0.12
22	15 14	23 14 9.68	5 47 36.3	0.5	1.8	0.12	6	12 7	23 8 26.96	6 24 25.0	0.5	1.8	0.12
23	15 10	23 14 4.64	5 48 10.2	0.5	1.8	0.12	7	12 3	23 8 18.09	6 25 20.8	0.5	1.8	0.12
24	15 6	23 13 59.45	5 48 44.9	0.5	1.8	0.12	8	11 59	23 8 9.20	6 26 16.5	0.5	1.8	0.12
25	15 2	23 13 54.11	5 49 20.4	0.5	1.8	0.12	9	11 55	23 8 0.32	6 27 12.1	0.5	1.8	0.12
26	14 58	23 13 48.64	-5 49 56.9	0.5	1.8	0.12	10	11 51	23 7 51.44	-6 28 7.6	0.5	1.8	0.12
27	14 54	23 13 43.04	5 50 34.2	0.5	1.8	0.12	11	11 47	23 7 42.56	6 29 3.0	0.5	1.8	0.12
28	14 50	23 13 37.30	5 51 12.2	0.5	1.8	0.12	12	11 43	23 7 33.69	6 29 58.4	0.5	1.8	0.12
29	14 46	23 13 31.43	5 51 51.1	0.5	1.8	0.12	13	11 39	23 7 24.83	6 30 53.6	0.5	1.8	0.12
30	14 42	23 13 25.42	5 52 30.8	0.5	1.8	0.12	14	11 35	23 7 15.99	6 31 48.7	0.5	1.8	0.12
31	14 38	23 13 19.29	-5 53 11.3	0.5	1.8	0.12	15	11 31	23 7 7.17	-6 32 43.6	0.5	1.8	0.12
Aug. 1	14 34	23 13 13.03	5 53 52.5	0.5	1.8	0.12	16	11 27	23 6 58.37	6 33 38.3	0.5	1.8	0.12
2	14 30	23 13 6.65	5 54 34.4	0.5	1.8	0.12	17	11 23	23 6 49.61	6 34 32.6	0.5	1.8	0.12
3	14 26	23 13 0.14	5 55 17.1	0.5	1.8	0.12	18	11 18	23 6 40.87	6 35 26.7	0.5	1.8	0.12
4	14 22	23 12 53.50	5 56 0.5	0.5	1.8	0.12	19	11 14	23 6 32.17	6 36 20.6	0.5	1.8	0.12
5	14 18	23 12 46.75	-5 56 44.6	0.5	1.8	0.12	20	11 10	23 6 23.52	-6 37 14.1	0.5	1.8	0.12
6	14 14	23 12 39.88	5 57 29.3	0.5	1.8	0.12	21	11 6	23 6 14.91	6 38 7.3	0.5	1.8	0.12
7	14 9	23 12 32.91	5 58 14.8	0.5	1.8	0.12	22	11 2	23 6 6.34	6 39 0.2	0.5	1.8	0.12
8	14 5	23 12 25.83	5 59 0.9	0.5	1.8	0.12	23	10 58	23 5 57.81	6 39 52.7	0.5	1.8	0.12
9	14 1	23 12 18.64	5 59 47.6	0.5	1.8	0.12	24	10 54	23 5 49.34	6 40 44.8	0.5	1.8	0.12
10	13 57	23 12 11.35	-6 0 34.9	0.5	1.8	0.12	25	10 50	23 5 40.94	-6 41 36.5	0.5	1.8	0.12
11	13 53	23 12 3.96	6 1 22.8	0.5	1.8	0.12	26	10 46	23 5 32.59	6 42 27.8	0.5	1.8	0.12
12	13 49	23 11 56.47	6 2 11.3	0.5	1.8	0.12	27	10 42	23 5 24.30	6 43 18.7	0.5	1.8	0.12
13	13 45	23 11 48.88	6 3 0.3	0.5	1.8	0.12	28	10 38	23 5 16.08	6 44 9.0	0.5	1.8	0.12
14	13 41	23 11 41.20	6 3 49.8	0.5	1.8	0.12	29	10 34	23 5 7.93	6 44 58.8	0.5	1.8	0.12
15	13 37	23 11 33.44	-6 4 39.9	0.5	1.8	0.12	30	10 30	23 4 59.85	-6 45 48.2	0.5	1.8	0.12
16	13 33	23 11 25.59	-6 5 30.4	0.5	1.8	0.12	Oct. 1	10 26	23 4 51.85	-6 46 37.0	0.5	1.8	0.12

Stellar magnitude at opposition in September, 1923, 6.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m	h m s	° ' "	"	" s		h m	h m s	° ' "	"	" s
Oct. 1	10 26	23 4 51.85	-6 46 37.0	0.5	1.8 0.12	Nov. 15	7 25	23 1 0.02	-7 9 10.9	0.5	1.7 0.12
2	10 22	23 4 43.93	6 47 25.2	0.5	1.8 0.12	16	7 21	23 0 58.56	7 9 17.5	0.5	1.7 0.12
3	10 17	23 4 36.09	6 48 12.9	0.5	1.8 0.12	17	7 17	23 0 57.29	7 9 22.8	0.5	1.7 0.12
4	10 13	23 4 28.34	6 49 0.0	0.5	1.8 0.12	18	7 13	23 0 56.20	7 9 27.0	0.5	1.7 0.12
5	10 9	23 4 20.68	6 49 46.5	0.5	1.8 0.12	19	7 9	23 0 55.29	7 9 30.1	0.4	1.7 0.12
6	10 5	23 4 13.12	-6 50 32.3	0.5	1.8 0.12	20	7 5	23 0 54.57	-7 9 32.0	0.4	1.7 0.12
7	10 1	23 4 5.65	6 51 17.4	0.5	1.8 0.12	21	7 1	23 0 54.04	7 9 32.7	0.4	1.7 0.12
8	9 57	23 3 58.28	6 52 1.8	0.5	1.8 0.12	22	6 57	23 0 53.70	7 9 32.3	0.4	1.7 0.12
9	9 53	23 3 51.02	6 52 45.6	0.5	1.8 0.12	23	6 53	23 0 53.55	7 9 30.6	0.4	1.7 0.12
10	9 49	23 3 43.86	6 53 28.7	0.5	1.8 0.12	24	6 49	23 0 53.58	7 9 27.7	0.4	1.7 0.12
11	9 45	23 3 36.81	-6 54 11.0	0.5	1.8 0.12	25	6 45	23 0 53.80	-7 9 23.7	0.4	1.7 0.12
12	9 41	23 3 29.88	6 54 52.6	0.5	1.8 0.12	26	6 41	23 0 54.21	7 9 18.6	0.4	1.7 0.12
13	9 37	23 3 23.07	6 55 33.4	0.5	1.8 0.12	27	6 38	23 0 54.81	7 9 12.3	0.4	1.7 0.12
14	9 33	23 3 16.38	6 56 13.4	0.5	1.8 0.12	28	6 34	23 0 55.61	7 9 4.7	0.4	1.7 0.12
15	9 29	23 3 9.81	6 56 52.5	0.5	1.8 0.12	29	6 30	23 0 56.60	7 8 55.9	0.4	1.7 0.12
16	9 25	23 3 3.37	-6 57 30.8	0.5	1.8 0.12	30	6 26	23 0 57.77	-7 8 46.0	0.4	1.7 0.12
17	9 21	23 2 57.06	6 58 8.3	0.5	1.8 0.12	Dec. 1	6 22	23 0 59.12	7 8 34.9	0.4	1.7 0.12
18	9 17	23 2 50.88	6 58 45.0	0.5	1.8 0.12	2	6 18	23 1 0.67	7 8 22.6	0.4	1.7 0.12
19	9 13	23 2 44.83	6 59 20.8	0.5	1.8 0.12	3	6 14	23 1 2.42	7 8 9.2	0.4	1.7 0.11
20	9 9	23 2 38.92	6 59 55.7	0.5	1.8 0.12	4	6 10	23 1 4.36	7 7 54.6	0.4	1.7 0.11
21	9 5	23 2 33.15	-7 0 29.7	0.5	1.8 0.12	5	6 6	23 1 6.48	-7 7 38.8	0.4	1.7 0.11
22	9 1	23 2 27.51	7 1 2.7	0.5	1.8 0.12	6	6 2	23 1 8.79	7 7 21.9	0.4	1.7 0.11
23	8 57	23 2 22.02	7 1 34.9	0.5	1.8 0.12	7	5 58	23 1 11.30	7 7 3.7	0.4	1.7 0.11
24	8 53	23 2 16.67	7 2 6.1	0.5	1.8 0.12	8	5 55	23 1 14.00	7 6 44.3	0.4	1.7 0.11
25	8 49	23 2 11.47	7 2 36.4	0.5	1.8 0.12	9	5 51	23 1 16.88	7 6 23.8	0.4	1.7 0.11
26	8 44	23 2 6.42	-7 3 5.7	0.5	1.8 0.12	10	5 47	23 1 19.95	-7 6 2.2	0.4	1.7 0.11
27	8 40	23 2 1.53	7 3 34.0	0.5	1.8 0.12	11	5 43	23 1 23.21	7 5 39.4	0.4	1.7 0.11
28	8 36	23 1 56.79	7 4 1.2	0.5	1.8 0.12	12	5 39	23 1 26.66	7 5 15.4	0.4	1.7 0.11
29	8 32	23 1 52.20	7 4 27.5	0.5	1.8 0.12	13	5 35	23 1 30.29	7 4 50.2	0.4	1.7 0.11
30	8 28	23 1 47.78	7 4 52.8	0.5	1.8 0.12	14	5 31	23 1 34.11	7 4 23.9	0.4	1.7 0.11
31	8 24	23 1 43.51	-7 5 17.1	0.5	1.8 0.12	15	5 27	23 1 38.11	-7 3 56.5	0.4	1.7 0.11
Nov. 1	8 20	23 1 39.40	7 5 40.4	0.5	1.8 0.12	16	5 24	23 1 42.30	7 3 28.0	0.4	1.7 0.11
2	8 16	23 1 35.46	7 6 2.5	0.5	1.8 0.12	17	5 20	23 1 46.67	7 2 58.4	0.4	1.7 0.11
3	8 12	23 1 31.69	7 6 23.6	0.5	1.8 0.12	18	5 16	23 1 51.22	7 2 27.6	0.4	1.7 0.11
4	8 8	23 1 28.08	7 6 43.7	0.5	1.8 0.12	19	5 12	23 1 55.94	7 1 55.7	0.4	1.7 0.11
5	8 4	23 1 24.65	-7 7 2.7	0.5	1.8 0.12	20	5 8	23 2 0.84	-7 1 22.8	0.4	1.7 0.11
6	8 0	23 1 21.39	7 7 20.5	0.5	1.8 0.12	21	5 4	23 2 5.92	7 0 48.7	0.4	1.7 0.11
7	7 57	23 1 18.30	7 7 37.2	0.5	1.8 0.12	22	5 0	23 2 11.18	7 0 13.6	0.4	1.7 0.11
8	7 53	23 1 15.38	7 7 52.9	0.5	1.8 0.12	23	4 57	23 2 16.61	6 59 37.4	0.4	1.7 0.11
9	7 49	23 1 12.64	7 8 7.5	0.5	1.8 0.12	24	4 53	23 2 22.21	6 59 0.1	0.4	1.7 0.11
10	7 45	23 1 10.09	-7 8 21.0	0.5	1.8 0.12	25	4 49	23 2 27.99	-6 58 21.8	0.4	1.7 0.11
11	7 41	23 1 7.72	7 8 33.3	0.5	1.7 0.12	26	4 45	23 2 33.94	6 57 42.4	0.4	1.7 0.11
12	7 37	23 1 5.52	7 8 44.4	0.5	1.7 0.12	27	4 41	23 2 40.05	6 57 2.0	0.4	1.7 0.11
13	7 33	23 1 3.50	7 8 54.3	0.5	1.7 0.12	28	4 37	23 2 46.33	6 56 20.5	0.4	1.7 0.11
14	7 29	23 1 1.67	7 9 3.2	0.5	1.7 0.12	29	4 34	23 2 52.78	6 55 38.0	0.4	1.7 0.11
15	7 25	23 1 0.02	-7 9 10.9	0.5	1.7 0.12	30	4 30	23 2 59.40	-6 54 54.6	0.4	1.7 0.11
16	7 21	23 0 58.56	-7 9 17.5	0.5	1.7 0.12	31	4 26	23 3 6.18	-6 54 10.1	0.4	1.7 0.11

Stellar magnitude at opposition in September, 1923, 6.1.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m s	° ' "	"	"	"	s		h m s	° ' "	"	"	"	s
Jan. 0	14 41	9 20 55.98	+15 41 38.1	0.3	1.2	0.09	Feb. 15	11 36	9 16 11.97	+16 4 0.0	0.3	1.3	0.09
1	14 37	9 20 51.05	15 42 1.9	0.3	1.2	0.09	16	11 32	9 16 5.43	16 4 30.4	0.3	1.3	0.09
2	14 33	9 20 46.02	15 42 26.2	0.3	1.2	0.09	17	11 27	9 15 58.92	16 5 0.6	0.3	1.3	0.09
3	14 29	9 20 40.90	15 42 50.9	0.3	1.2	0.09	18	11 23	9 15 52.43	16 5 30.6	0.3	1.3	0.09
4	14 25	9 20 35.69	15 43 16.0	0.3	1.2	0.09	19	11 19	9 15 45.98	16 6 0.5	0.3	1.3	0.09
5	14 21	9 20 30.41	+15 43 41.5	0.3	1.2	0.09	20	11 15	9 15 39.57	+16 6 30.2	0.3	1.3	0.09
6	14 17	9 20 25.05	15 44 7.2	0.3	1.2	0.09	21	11 11	9 15 33.20	16 6 59.7	0.3	1.3	0.09
7	14 13	9 20 19.60	15 44 33.3	0.3	1.2	0.09	22	11 7	9 15 26.86	16 7 29.0	0.3	1.3	0.09
8	14 9	9 20 14.07	15 44 59.8	0.3	1.2	0.09	23	11 3	9 15 20.56	16 7 58.1	0.3	1.3	0.09
9	14 5	9 20 8.48	15 45 26.6	0.3	1.2	0.09	24	10 59	9 15 14.32	16 8 26.9	0.3	1.3	0.09
10	14 1	9 20 2.82	+15 45 53.7	0.3	1.3	0.09	25	10 55	9 15 8.12	+16 8 55.5	0.3	1.3	0.09
11	13 57	9 19 57.08	15 46 21.2	0.3	1.3	0.09	26	10 51	9 15 1.97	16 9 23.9	0.3	1.3	0.09
12	13 53	9 19 51.27	15 46 48.9	0.3	1.3	0.09	27	10 47	9 14 55.88	16 9 52.0	0.3	1.3	0.09
13	13 49	9 19 45.40	15 47 16.9	0.3	1.3	0.09	28	10 43	9 14 49.84	16 10 19.8	0.3	1.3	0.09
14	13 45	9 19 39.46	15 47 45.2	0.3	1.3	0.09	Mar. 1	10 39	9 14 43.86	16 10 47.4	0.3	1.3	0.09
15	13 41	9 19 33.46	+15 48 13.7	0.3	1.3	0.09	2	10 35	9 14 37.94	+16 11 14.6	0.3	1.3	0.09
16	13 37	9 19 27.41	15 48 42.5	0.3	1.3	0.09	3	10 31	9 14 32.08	16 11 41.6	0.3	1.3	0.09
17	13 33	9 19 21.30	15 49 11.5	0.3	1.3	0.09	4	10 27	9 14 26.29	16 12 8.3	0.3	1.3	0.09
18	13 29	9 19 15.14	15 49 40.8	0.3	1.3	0.09	5	10 23	9 14 20.55	16 12 34.6	0.3	1.3	0.09
19	13 25	9 19 8.93	15 50 10.2	0.3	1.3	0.09	6	10 19	9 14 14.88	16 13 0.6	0.3	1.3	0.09
20	13 21	9 19 2.68	+15 50 39.8	0.3	1.3	0.09	7	10 15	9 14 9.29	+16 13 26.3	0.3	1.3	0.09
21	13 17	9 18 56.37	15 51 9.7	0.3	1.3	0.09	8	10 11	9 14 3.77	16 13 51.7	0.3	1.3	0.09
22	13 13	9 18 50.02	15 51 39.7	0.3	1.3	0.09	9	10 7	9 13 58.33	16 14 16.7	0.3	1.2	0.09
23	13 9	9 18 43.64	15 52 9.9	0.3	1.3	0.09	10	10 3	9 13 52.97	16 14 41.3	0.3	1.2	0.09
24	13 5	9 18 37.22	15 52 40.2	0.3	1.3	0.09	11	9 59	9 13 47.68	16 15 5.5	0.3	1.2	0.09
25	13 1	9 18 30.77	+15 53 10.7	0.3	1.3	0.09	12	9 55	9 13 42.47	+16 15 29.4	0.3	1.2	0.09
26	12 56	9 18 24.28	15 53 41.2	0.3	1.3	0.09	13	9 51	9 13 37.34	16 15 52.9	0.3	1.2	0.09
27	12 52	9 18 17.77	15 54 11.9	0.3	1.3	0.09	14	9 47	9 13 32.30	16 16 15.9	0.3	1.2	0.09
28	12 48	9 18 11.23	15 54 42.7	0.3	1.3	0.09	15	9 43	9 13 27.35	16 16 38.6	0.3	1.2	0.09
29	12 44	9 18 4.66	15 55 13.6	0.3	1.3	0.09	16	9 39	9 13 22.49	16 17 0.8	0.3	1.2	0.09
30	12 40	9 17 58.07	+15 55 44.6	0.3	1.3	0.09	17	9 35	9 13 17.72	+16 17 22.6	0.3	1.2	0.09
31	12 36	9 17 51.47	15 56 15.6	0.3	1.3	0.09	18	9 31	9 13 13.04	16 17 44.0	0.3	1.2	0.09
Feb. 1	12 32	9 17 44.84	15 56 46.6	0.3	1.3	0.09	19	9 27	9 13 8.46	16 18 5.0	0.3	1.2	0.09
2	12 28	9 17 38.20	15 57 17.7	0.3	1.3	0.09	20	9 23	9 13 3.98	16 18 25.5	0.3	1.2	0.09
3	12 24	9 17 31.56	15 57 48.9	0.3	1.3	0.09	21	9 19	9 12 59.59	16 18 45.5	0.3	1.2	0.09
4	12 20	9 17 24.91	+15 58 20.1	0.3	1.3	0.09	22	9 15	9 12 55.31	+16 19 5.0	0.3	1.2	0.09
5	12 16	9 17 18.26	15 58 51.2	0.3	1.3	0.09	23	9 11	9 12 51.13	16 19 24.2	0.3	1.2	0.09
6	12 12	9 17 11.60	15 59 22.3	0.3	1.3	0.09	24	9 7	9 12 47.05	16 19 42.9	0.3	1.2	0.09
7	12 8	9 17 4.94	15 59 53.5	0.3	1.3	0.09	25	9 3	9 12 43.08	16 20 1.0	0.3	1.2	0.09
8	12 4	9 16 58.28	16 0 24.5	0.3	1.3	0.09	26	8 59	9 12 39.21	16 20 18.7	0.3	1.2	0.09
9	12 0	9 16 51.63	+16 0 55.5	0.3	1.3	0.09	27	8 55	9 12 35.45	+16 20 35.9	0.3	1.2	0.09
10	11 56	9 16 44.98	16 1 26.5	0.3	1.3	0.09	28	8 51	9 12 31.80	16 20 52.6	0.3	1.2	0.09
11	11 52	9 16 38.34	16 1 57.4	0.3	1.3	0.09	29	8 47	9 12 28.26	16 21 8.7	0.3	1.2	0.09
12	11 48	9 16 31.72	16 2 28.3	0.3	1.3	0.09	30	8 43	9 12 24.84	16 21 24.4	0.3	1.2	0.09
13	11 44	9 16 25.12	16 2 59.0	0.3	1.3	0.09	31	8 39	9 12 21.52	16 21 39.6	0.3	1.2	0.09
14	11 40	9 16 18.53	+16 3 29.5	0.3	1.3	0.09	Apr. 1	8 35	9 12 18.31	+16 21 54.2	0.3	1.2	0.09
15	11 36	9 16 11.97	+16 4 0.0	0.3	1.3	0.09	2	8 31	9 12 15.23	+16 22 8.3	0.3	1.2	0.09

Stellar magnitude at opposition in February, 1923, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.	Date.	Wash. Mean Time.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam. S. T. of Sem. Pass. Mer.
	h m s	h m s	° ' " "	"	" s		h m s	h m s	° ' " "	"	" s
Apr. 1	8 35	9 12 18.31	+16 21 54.2	0.3	1.2 0.09	Nov. 15	17 53	9 31 25.60	+14 55 18.5	0.3	1.2 0.08
2	8 31	9 12 15.23	16 22 8.3	0.3	1.2 0.09	16	17 50	9 31 26.52	14 55 15.2	0.3	1.2 0.08
3	8 27	9 12 12.27	16 22 21.9	0.3	1.2 0.09	17	17 46	9 31 27.32	14 55 12.6	0.3	1.2 0.08
4	8 23	9 12 9.41	16 22 34.9	0.3	1.2 0.09	18	17 42	9 31 27.98	14 55 10.6	0.3	1.2 0.08
5	8 19	9 12 6.67	16 22 47.4	0.3	1.2 0.09	19	17 38	9 31 28.51	14 55 9.2	0.3	1.2 0.08
6	8 15	9 12 4.06	+16 22 59.4	0.3	1.2 0.09	20	17 34	9 31 28.90	+14 55 8.5	0.3	1.2 0.08
7	8 11	9 12 1.57	16 23 10.9	0.3	1.2 0.09	21	17 30	9 31 29.16	14 55 8.4	0.3	1.2 0.08
8	8 7	9 11 59.20	16 23 21.8	0.3	1.2 0.09	22	17 26	9 31 29.29	14 55 9.0	0.3	1.2 0.08
9	8 3	9 11 56.95	16 23 32.1	0.3	1.2 0.09	23	17 22	9 31 29.28	14 55 10.3	0.3	1.2 0.08
10	7 59	9 11 54.82	16 23 41.9	0.3	1.2 0.09	24	17 18	9 31 29.13	14 55 12.2	0.3	1.2 0.08
11	7 55	9 11 52.81	+16 23 51.1	0.3	1.2 0.09	25	17 14	9 31 28.85	+14 55 14.7	0.3	1.2 0.08
12	7 51	9 11 50.93	16 23 59.8	0.3	1.2 0.09	26	17 10	9 31 28.44	14 55 17.9	0.3	1.2 0.08
13	7 47	9 11 49.18	16 24 8.0	0.3	1.2 0.09	27	17 6	9 31 27.90	14 55 21.7	0.3	1.2 0.08
14	7 43	9 11 47.55	16 24 15.5	0.3	1.2 0.09	28	17 2	9 31 27.23	14 55 26.2	0.3	1.2 0.08
15	7 39	9 11 46.05	16 24 22.4	0.3	1.2 0.09	29	16 58	9 31 26.43	14 55 31.3	0.3	1.2 0.08
16	7 35	9 11 44.68	+16 24 28.8	0.3	1.2 0.09	30	16 54	9 31 25.49	+14 55 37.0	0.3	1.2 0.08
17	7 31	9 11 43.44	16 24 34.7	0.3	1.2 0.09	Dec. 1	16 51	9 31 24.42	14 55 43.4	0.3	1.2 0.08
18	7 27	9 11 42.33	16 24 39.9	0.3	1.2 0.09	2	16 47	9 31 23.21	14 55 50.5	0.3	1.2 0.08
19	7 23	9 11 41.35	16 24 44.5	0.3	1.2 0.09	3	16 43	9 31 21.87	14 55 58.2	0.3	1.2 0.08
20	7 19	9 11 40.50	16 24 48.6	0.3	1.2 0.09	4	16 39	9 31 20.41	14 56 6.5	0.3	1.2 0.08
21	7 16	9 11 39.78	+16 24 52.1	0.3	1.2 0.09	5	16 35	9 31 18.82	+14 56 15.4	0.3	1.2 0.08
22	7 12	9 11 39.18	16 24 55.0	0.3	1.2 0.09	6	16 31	9 31 17.10	14 56 24.9	0.3	1.2 0.08
23	7 8	9 11 38.72	16 24 57.3	0.3	1.2 0.09	7	16 27	9 31 15.24	14 56 35.1	0.3	1.2 0.08
24	7 4	9 11 38.39	16 24 59.1	0.3	1.2 0.09	8	16 23	9 31 13.25	14 56 45.8	0.3	1.2 0.08
25	7 0	9 11 38.19	16 25 0.2	0.3	1.2 0.08	9	16 19	9 31 11.14	14 56 57.2	0.3	1.2 0.08
26	6 56	9 11 38.13	+16 25 0.8	0.3	1.2 0.08	10	16 15	9 31 8.90	+14 57 9.2	0.3	1.2 0.08
27	6 52	9 11 38.19	16 25 0.8	0.3	1.2 0.08	11	16 11	9 31 6.54	14 57 21.8	0.3	1.2 0.08
28	6 48	9 11 38.38	16 25 0.2	0.3	1.2 0.08	12	16 7	9 31 4.05	14 57 35.0	0.3	1.2 0.09
29	6 44	9 11 38.70	16 24 59.0	0.3	1.2 0.08	13	16 3	9 31 1.44	14 57 48.8	0.3	1.2 0.09
30	6 40	9 11 39.16	16 24 57.3	0.3	1.2 0.08	14	15 59	9 30 58.72	14 58 3.2	0.3	1.2 0.09
May 1	6 36	9 11 39.75	+16 24 55.0	0.3	1.2 0.08	15	15 55	9 30 55.87	+14 58 18.2	0.3	1.2 0.09
.....	.....	.....	.....	.....	.....	16	15 51	9 30 52.90	14 58 33.7	0.3	1.2 0.09
.....	.....	.....	.....	.....	.....	17	15 47	9 30 49.82	14 58 49.8	0.3	1.2 0.09
Nov. 2	18 44	9 31 1.42	+14 57 0.2	0.3	1.2 0.08	18	15 43	9 30 46.61	14 59 6.5	0.3	1.2 0.09
3	18 40	9 31 4.07	14 56 48.6	0.3	1.2 0.08	19	15 39	9 30 43.29	14 59 23.6	0.3	1.2 0.09
4	18 36	9 31 6.59	+14 56 37.6	0.3	1.2 0.08	20	15 35	9 30 39.86	+14 59 41.3	0.3	1.2 0.09
5	18 32	9 31 8.98	14 56 27.2	0.3	1.2 0.08	21	15 31	9 30 36.31	14 59 59.6	0.3	1.2 0.09
6	18 29	9 31 11.23	14 56 17.5	0.3	1.2 0.08	22	15 27	9 30 32.65	15 0 18.4	0.3	1.2 0.09
7	18 25	9 31 13.36	14 56 8.4	0.3	1.2 0.08	23	15 23	9 30 28.89	15 0 37.7	0.3	1.2 0.09
8	18 21	9 31 15.36	14 55 59.9	0.3	1.2 0.08	24	15 19	9 30 25.01	15 0 57.6	0.3	1.2 0.09
9	18 17	9 31 17.22	+14 55 52.1	0.3	1.2 0.08	25	15 15	9 30 21.03	+15 1 18.0	0.3	1.2 0.09
10	18 13	9 31 18.95	14 55 44.9	0.3	1.2 0.08	26	15 11	9 30 16.95	15 1 38.8	0.3	1.2 0.09
11	18 9	9 31 20.54	14 55 38.3	0.3	1.2 0.08	27	15 7	9 30 12.76	15 2 0.1	0.3	1.2 0.09
12	18 5	9 31 22.00	14 55 32.4	0.3	1.2 0.08	28	15 3	9 30 8.46	15 2 21.9	0.3	1.2 0.09
13	18 1	9 31 23.34	14 55 27.1	0.3	1.2 0.08	29	14 59	9 30 4.07	15 2 44.1	0.3	1.2 0.09
14	17 57	9 31 24.54	+14 55 22.5	0.3	1.2 0.08	30	14 55	9 29 59.58	+15 3 6.9	0.3	1.2 0.09
15	17 53	9 31 25.60	+14 55 18.5	0.3	1.2 0.08	31	14 51	9 29 54.99	+15 3 30.1	0.3	1.2 0.09

Stellar magnitude at opposition in February, 1923, 7.7.

PART III.

PHENOMENA.

In the year 1923 there will be four eclipses, two of the Sun and two of the Moon.

I.—*A Partial Eclipse of the Moon*, March 2, 1923, visible at Washington; the beginning visible generally in western Asia, Europe, Africa, the Atlantic Ocean, South America, North America except in the extreme northwestern part, and the eastern part of the Pacific Ocean; the ending visible generally in Europe, Africa except the eastern part, the Atlantic Ocean, North America, South America, and the eastern part of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, March 2				d	h	m	s
				2	15	57	27.0
Sun's right ascension	h	m	s	22	51	57.76	
Hourly motion							9.34
Moon's right ascension	10	51	57.76				143.76
Hourly motion							
Sun's declination	-7	13	50.1				+ 0 57.2
Hourly motion							
Moon's declination	+6	21	59.4				-11 0.7
Hourly motion							
Sun's equa. hor. parallax			8.9				16 8.0
Sun's true semidiameter							
Moon's equa. hor. parallax	60	43.2					16 31.9
Moon's true semidiameter							

CIRCUMSTANCES OF THE ECLIPSE.

Moon enters penumbra	March	d	h	m	Greenwich Mean Time.	
Moon enters umbra		2	13	12.6		
Middle of the eclipse		2	14	27.8		
Moon leaves umbra		2	15	31.8		
Moon leaves penumbra		2	16	35.8		
		2	17	50.8		
Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,				and in Latitude.
	°			'	°	'
First	54 to E.	+34	42		+6	38
Last	20 to W.	+65	31		+6	15

Magnitude of the eclipse=0.376 (Moon's diameter=1.0).

II.—*An Annular Eclipse of the Sun*, March 16–17, 1923, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, March 17				d	h	m	s
				17	0	24	3.6
Sun and Moon's R. A.	h	m	s	23	44	56.02	
Hourly motions							9.14 and 113.74
Sun's declination	-1	37	55.0				+0 59.3
Hourly motion							
Moon's declination	-2	8	47.1				+9 17.8
Hourly motion							
Sun's equa. hor. parallax			8.8				16 4.2
Sun's true semidiameter							
Moon's equa. hor. parallax	54	13.6					14 45.8
Moon's true semidiameter							

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.		Latitude.	
		d	h	m	°	'	°	'
Eclipse begins	March	16	21	50.4	+56	43	-38	5
Central eclipse begins		16	23	5.5	+76	13	-50	49
Central eclipse at local apparent noon		17	0	24.1	+ 3	50	-36	40
Central eclipse ends		17	2	23.8	-56	40	-15	25
Eclipse ends		17	3	38.9	-37	31	- 2	39

III.—*A Partial Eclipse of the Moon*, August 25–26, 1923, visible at Washington; the beginning visible generally in North America except the extreme northeastern part, the western part of South America, the Pacific Ocean, Australia except the extreme southwestern part, and the extreme northeastern part of Asia; the ending visible generally in North America except the northeastern part, the extreme northwestern part of South America, the Pacific Ocean, Australia, and the eastern part of Asia.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, Aug. 25						
					d	h m s
Sun's right ascension	h	m	s			
	10	16	40.28	Hourly motion		9.17
Moon's right ascension	22	16	40.28	Hourly motion		124.32
Sun's declination	+10	42	5.9	Hourly motion	–	0 51.8
Moon's declination	–	9	49 6.1	Hourly motion	+	8 39.0
Sun's equa. hor. parallax			8.7	Sun's true semidiameter		15 49.7
Moon's equa. hor. parallax	55	57.7		Moon's true semidiameter		15 14.2

CIRCUMSTANCES OF THE ECLIPSE.

		d	h	m	Greenwich Mean Time.
		Aug. 25	20	12.3	
Moon enters penumbra		25	21	51.8	
Moon enters umbra		25	22	39.5	
Middle of the eclipse		25	23	27.3	
Moon leaves umbra		26	1	6.4	
Moon leaves penumbra		26	1	6.4	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith			
		in Longitude from Greenwich,		and in Latitude.	
First	140 to E.	+148	4	–10	0
Last	171 to W.	+171	10	–	9 46

Magnitude of the eclipse=0.168 (Moon's diameter=1.0).

IV.—*A Total Eclipse of the Sun*, September 10, 1923, visible at Washington as a partial eclipse.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of δ in right ascension, Sept. 10						
					d	h m s
Sun and Moon's R. A.	h	m	s			
	11	12	29.37	Hourly motions	9.00 and	139.60
Sun's declination	+5	6	3.7	Hourly motion	–	0 56.8
Moon's declination	+5	38	18.1	Hourly motion	–	11 3.2
Sun's equa. hor. parallax			8.7	Sun's true semidiameter		15 53.2
Moon's equa. hor. parallax	59	56.8		Moon's true semidiameter		16 19.3

CIRCUMSTANCES OF THE ECLIPSE.

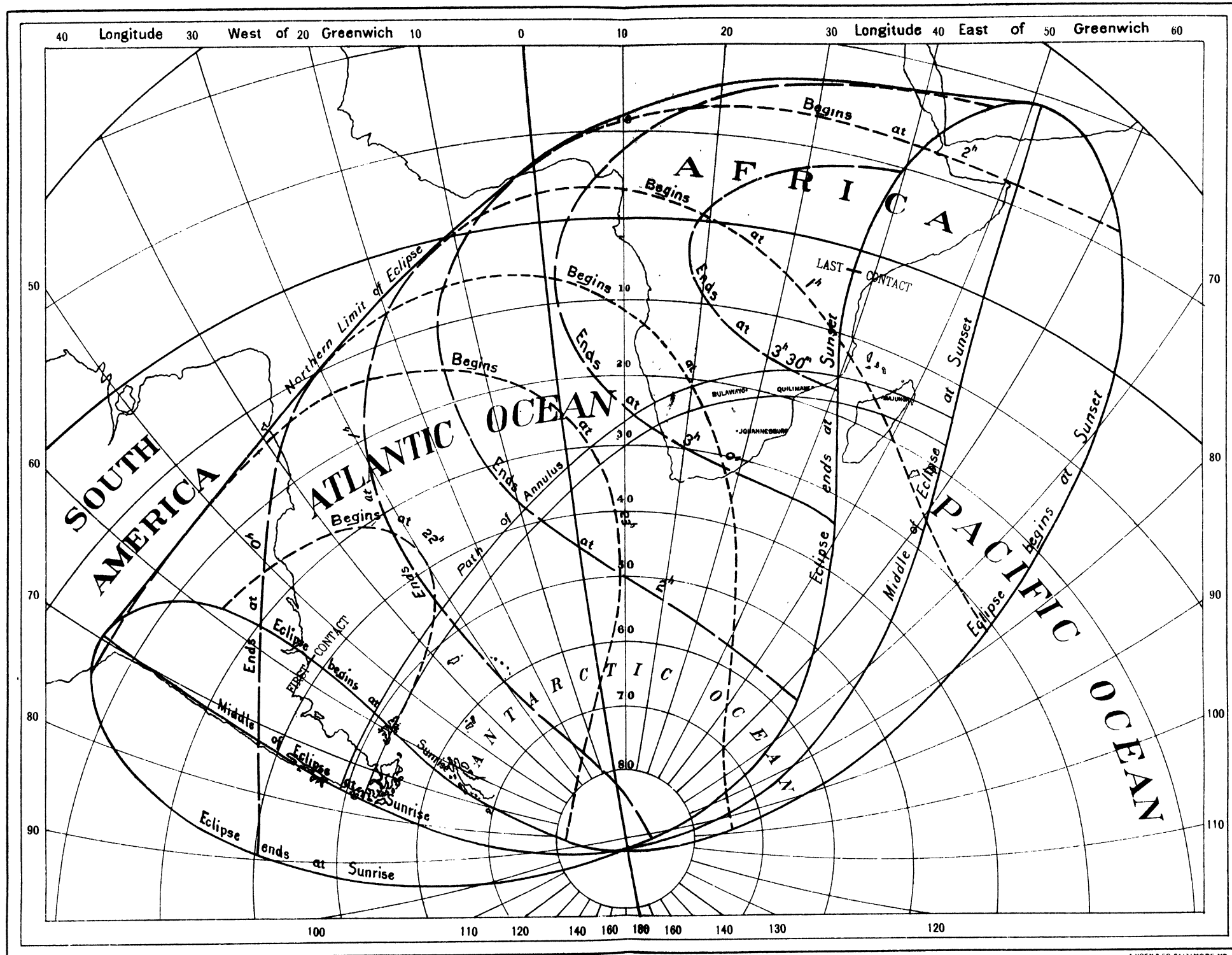
	Greenwich Mean Time.			Longitude from Greenwich.	Latitude.
	d	h	m		
Eclipse begins	Sept. 10	6	14.3	–171 51	+36 51
Central eclipse begins	10	7	16.9	–154 18	+48 16
Central eclipse at local apparent noon	10	8	30.2	+128 16	+37 58
Central eclipse ends	10	10	17.4	+ 63 51	+13 43
Eclipse ends	10	11	19.9	+ 80 31	+ 2 15

BESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN,
MARCH 16-17, 1923.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	μ	<i>l</i> ₁	<i>l</i> ₂
h m							
21 50	-1.24067	-0.96488	-8.46502	+9.99982	325 18.6	+0.56999	+0.02395
22 0	-1.16015	-0.93931	-8.46432	+9.99982	327 48.6	+0.57000	+0.02397
10	0.07962	0.91375	8.46362	9.99982	330 18.7	0.57002	0.02398
20	0.99910	0.88818	8.46292	9.99982	332 48.7	0.57004	0.02400
30	0.91857	0.86261	8.46222	9.99982	335 18.7	0.57005	0.02401
40	0.83804	0.83704	8.46152	9.99982	337 48.8	0.57007	0.02403
50	0.75751	0.81146	8.46082	9.99982	340 18.8	0.57008	0.02404
23 0	-0.67697	-0.78588	-8.46011	+9.99982	342 48.9	+0.57009	+0.02405
10	0.59644	0.76030	8.45941	9.99982	345 18.9	0.57011	0.02407
20	0.51590	0.73472	8.45870	9.99982	347 48.9	0.57012	0.02408
30	0.43537	0.70914	8.45800	9.99982	350 19.0	0.57013	0.02409
40	0.35483	0.68355	8.45729	9.99982	352 49.0	0.57014	0.02410
50	0.27430	0.65797	8.45658	9.99982	355 19.1	0.57015	0.02411
0 0	-0.19376	-0.63238	-8.45587	+9.99982	357 49.1	+0.57016	+0.02412
10	0.11322	0.60679	8.45516	9.99982	0 19.2	0.57017	0.02413
20	-0.03269	0.58119	8.45444	9.99982	2 49.2	0.57018	0.02414
30	+0.04784	0.55560	8.45373	9.99982	5 19.2	0.57019	0.02415
40	0.12838	0.53000	8.45301	9.99982	7 49.3	0.57020	0.02416
50	0.20891	0.50441	8.45230	9.99983	10 19.3	0.57020	0.02416
1 0	+0.28944	-0.47881	-8.45158	+9.99983	12 49.4	+0.57021	+0.02417
10	0.36997	0.45321	8.45086	9.99983	15 19.4	0.57022	0.02418
20	0.45050	0.42761	8.45014	9.99983	17 49.4	0.57022	0.02418
30	0.53103	0.40201	8.44942	9.99983	20 19.5	0.57023	0.02419
40	0.61155	0.37640	8.44870	9.99983	22 49.5	0.57023	0.02419
50	0.69208	0.35080	8.44797	9.99983	25 19.6	0.57023	0.02419
2 0	+0.77260	-0.32519	-8.44725	+9.99983	27 49.6	+0.57024	+0.02420
10	0.85312	0.29958	8.44652	9.99983	30 19.7	0.57024	0.02420
20	0.93363	0.27398	8.44580	9.99983	32 49.7	0.57024	0.02420
30	1.01414	0.24837	8.44507	9.99983	35 19.7	0.57024	0.02421
40	1.09465	0.22276	8.44434	9.99983	37 49.8	0.57025	0.02421
50	1.17516	0.19715	8.44361	9.99983	40 19.8	0.57025	0.02421
3 0	+1.25566	-0.17153	-8.44287	+9.99983	42 49.9	+0.57025	+0.02421
10	1.33616	0.14592	8.44214	9.99983	45 19.9	0.57025	0.02421
20	1.41665	0.12031	8.44141	9.99983	47 49.9	0.57025	0.02421
30	1.49714	0.09469	8.44067	9.99983	50 20.0	0.57024	0.02420
40	+1.57763	-0.06908	-8.43993	+9.99983	52 50.0	+0.57024	+0.02420

Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
21 0	+7.9059	+7.4074	+1.1762	+7.67204	+7.66987
22 0	7.9059	7.4077	1.1762	7.67203	7.66986
23 0	7.9060	7.4079	1.1762	7.67203	7.66986
0 0	7.9060	7.4081	1.1762	7.67202	7.66985
1 0	7.9060	7.4082	1.1762	7.67202	7.66985
2 0	7.9059	7.4083	1.1762	7.67201	7.66984
3 0	7.9058	7.4084	1.1762	7.67201	7.66984
4 0	+7.9057	+7.4085	+1.1762	+7.67200	+7.66984

ANNULAR ECLIPSE OF MARCH 16-17, 1923.



Note :- The hours of beginning and ending are expressed in Greenwich Mean Time.

PATH OF ANNULAR PHASE DURING THE ECLIPSE OF THE SUN,
MARCH 16-17, 1923.

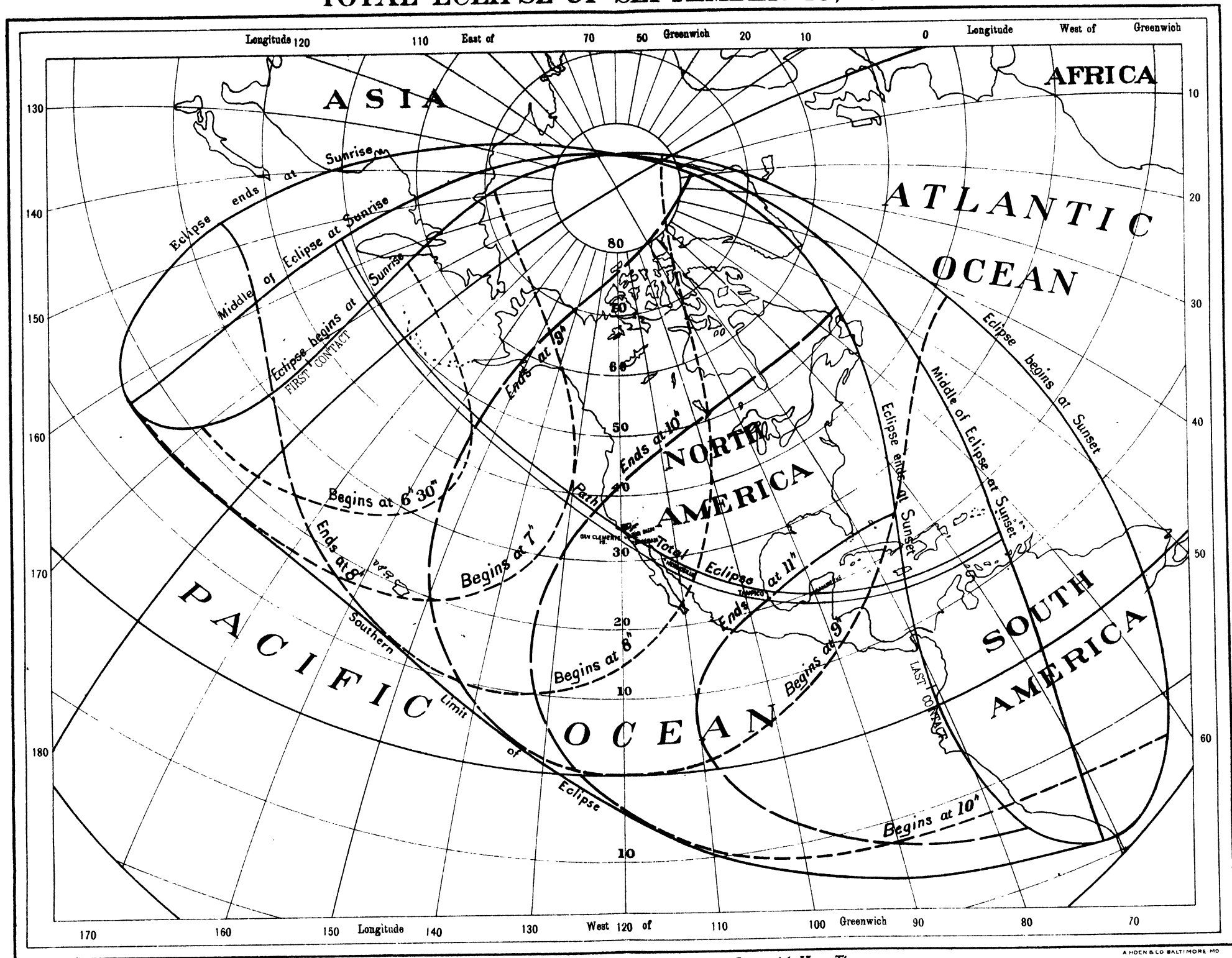
Green- wich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Annular Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	m s
23 ^h 10 ^m	-49 11	+75 38	-50 49	+76 13	-52 29	+76 50	6 . . .
15	48 38.9	51 11.5	50 25.7	54 26.5	52 17.4	59 13.5	6 7.2
20	47 50.0	43 34.9	49 33.9	45 25.1	51 22.8	47 48.8	6 21.8
25	46 57.8	37 52.1	48 38.4	39 0.7	50 23.6	40 27.8	6 33.4
	46 4.3	33 13.0	47 41.8	33 55.5	49 23.4	34 49.9	6 43.5
30	-45 10.0	+29 16.3	-46 44.5	+29 40.5	-48 22.8	+30 12.8	6 52.4
35	44 15.4	25 50.3	45 47.1	26 0.6	47 22.4	26 16.9	7 0.5
40	43 20.7	22 47.5	44 49.8	22 47.1	46 22.3	22 51.2	7 7.8
45	42 26.2	20 2.8	43 52.9	19 53.9	45 22.8	19 48.3	7 14.4
50	41 31.8	17 32.8	42 56.3	17 17.1	44 23.8	17 3.6	7 20.5
55	40 37.5	15 15.1	42 0.0	14 53.7	43 25.3	14 33.6	7 26.0
0 0	-39 43.4	+13 7.6	-41 4.0	+12 41.3	-42 27.3	+12 15.6	7 30.9
5	38 49.5	11 8.6	40 8.4	10 38.1	41 29.8	10 7.7	7 35.3
10	37 55.9	9 16.8	39 13.3	8 42.7	40 33.1	8 8.3	7 39.1
15	37 2.6	7 31.0	38 18.5	6 53.8	39 36.7	6 15.9	7 42.4
20	36 9.5	5 50.6	37 24.1	5 10.5	38 40.9	4 29.5	7 45.1
25	35 16.7	4 14.5	36 30.0	3 31.9	37 45.4	2 48.2	7 47.3
30	-34 24.0	+ 2 42.1	-35 36.2	+ 1 57.1	-36 50.5	+ 1 11.0	7 49.1
35	33 31.5	+ 1 12.6	34 42.8	+ 0 25.4	35 56.1	- 0 23.0	7 50.4
40	32 39.3	- 0 14.5	33 49.7	- 1 3.6	35 2.0	1 54.1	7 51.1
45	31 47.3	1 39.7	32 56.9	2 30.6	34 8.4	3 23.1	7 51.3
50	30 55.3	3 3.4	32 4.3	3 56.2	33 15.1	4 50.6	7 51.0
55	30 3.6	4 26.3	31 12.0	5 20.9	32 22.1	6 17.1	7 50.1
1 0	-29 12.0	- 5 48.9	-30 19.9	- 6 45.2	-31 29.5	- 7 43.2	7 48.9
5	28 20.5	7 11.6	29 28.0	8 9.7	30 37.2	9 9.5	7 47.1
10	27 29.0	8 34.9	28 36.2	9 34.8	29 45.1	10 36.5	7 44.7
15	26 37.5	9 59.5	27 44.6	11 1.2	28 53.3	12 4.9	7 41.9
20	25 46.3	11 25.8	26 53.3	12 29.5	28 1.9	13 35.3	7 38.6
25	24 55.1	12 54.7	26 2.0	14 0.4	27 10.5	15 8.4	7 34.8
30	-24 3.8	-14 26.8	-25 10.7	-15 34.7	-26 19.2	-16 45.2	7 30.4
35	23 12.5	16 2.9	24 19.5	17 13.4	25 28.1	18 26.8	7 25.5
40	22 21.0	17 44.2	23 28.2	18 57.6	24 37.0	20 14.3	7 20.0
45	21 29.4	19 32.0	22 36.9	20 48.8	23 46.0	22 9.4	7 14.0
50	20 37.5	21 28.2	21 45.4	22 49.0	22 54.9	24 14.2	7 7.5
55	19 45.3	23 35.0	20 53.7	25 0.7	22 3.7	26 31.6	7 0.3
2 0	-18 52.8	-25 55.4	-20 1.7	-27 27.5	-21 12.2	-29 6.0	6 52.3
5	17 59.7	28 34.6	19 9.2	30 15.6	20 20.4	32 4.7	6 43.4
10	17 5.6	31 40.5	18 15.8	33 34.7	19 27.8	35 40.6	6 33.4
15	16 10.1	35 28.9	17 21.0	37 45.6	18 33.8	40 23.0	6 21.7
20	15 11.9	40 37.2	16 23.1	43 48.0	17 35.8	48 5.6	6 6.7
Limits.	-13 46	-56 9	-15 25	-56 40	-17 6	-57 12	. . . .

BESSELIAN ELEMENTS OF THE TOTAL ECLIPSE OF THE SUN,
SEPTEMBER 10, 1923.

Greenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Umbra on Fundamental Plane.	
	<i>x</i>	<i>y</i>	Log sin <i>d</i>	Log cos <i>d</i>	μ	<i>l</i> ₁	<i>l</i> ₂
h m					° ′		
6 10	-1.26919	+0.93402	+8.95189	+9.99825	93 12.7	+0.53873	-0.00715
20	1.17865	0.90587	8.95167	9.99825	95 42.7	0.53872	0.00716
30	1.08810	0.87772	8.95146	9.99826	98 12.8	0.53872	0.00716
40	0.99754	0.84957	8.95124	9.99826	100 42.8	0.53871	0.00717
50	0.90699	0.82141	8.95102	9.99826	103 12.9	0.53870	0.00718
7 0	-0.81643	+0.79324	+8.95081	+9.99826	105 42.9	+0.53870	-0.00718
10	0.72588	0.76507	8.95059	9.99826	108 13.0	0.53869	0.00719
20	0.63532	0.73690	8.95037	9.99826	110 43.0	0.53868	0.00720
30	0.54475	0.70872	8.95016	9.99827	113 13.1	0.53867	0.00721
40	0.45419	0.68054	8.94994	9.99827	115 43.1	0.53866	0.00722
50	0.36363	0.65236	8.94972	9.99827	118 13.2	0.53865	0.00723
8 0	-0.27306	+0.62417	+8.94950	+9.99827	120 43.2	+0.53864	-0.00724
10	0.18250	0.59598	8.94929	9.99827	123 13.3	0.53863	0.00725
20	0.09193	0.56778	8.94907	9.99827	125 43.3	0.53861	0.00727
30	-0.00137	0.53958	8.94885	9.99828	128 13.4	0.53860	0.00728
40	+0.08920	0.51138	8.94864	9.99828	130 43.4	0.53858	0.00729
50	0.17976	0.48317	8.94842	9.99828	133 13.5	0.53857	0.00731
9 0	+0.27033	+0.45496	+8.94820	+9.99828	135 43.5	+0.53855	-0.00733
10	0.36089	0.42675	8.94798	9.99828	138 13.6	0.53854	0.00734
20	0.45146	0.39854	8.94776	9.99828	140 43.6	0.53852	0.00736
30	0.54202	0.37032	8.94755	9.99829	143 13.7	0.53850	0.00738
40	0.63259	0.34209	8.94733	9.99829	145 43.7	0.53849	0.00739
50	0.72315	0.31387	8.94711	9.99829	148 13.8	0.53847	0.00741
10 0	+0.81371	+0.28564	+8.94689	+9.99829	150 43.8	+0.53845	-0.00743
10	0.90427	0.25741	8.94667	9.99829	153 13.9	0.53843	0.00745
20	0.99482	0.22918	8.94645	9.99829	155 43.9	0.53841	0.00747
30	1.08538	0.20094	8.94623	9.99830	158 14.0	0.53838	0.00750
40	1.17593	0.17270	8.94601	9.99830	160 44.0	0.53836	0.00752
50	1.26648	0.14446	8.94580	9.99830	163 14.1	0.53834	0.00754
11 0	+1.35702	+0.11621	+8.94558	+9.99830	165 44.1	+0.53831	-0.00757
10	1.44757	0.08796	8.94536	9.99830	168 14.2	0.53829	0.00759
20	+1.53811	+0.05971	+8.94514	+9.99830	170 44.2	+0.53826	-0.00761

Greenwich Mean Time.	Log <i>x'</i> for 1 Minute.	Log <i>y'</i> for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Umbra.
h m					
6 0	+7.9569	-7.4494	+1.1762	+7.66688	+7.66471
7 0	7.9569	7.4497	1.1762	7.66689	7.66472
8 0	7.9570	7.4501	1.1762	7.66689	7.66472
9 0	7.9570	7.4504	1.1762	7.66690	7.66473
10 0	7.9569	7.4507	1.1762	7.66690	7.66473
11 0	7.9569	7.4510	1.1762	7.66690	7.66474
12 0	+7.9568	-7.4512	+1.1762	+7.66691	+7.66474

TOTAL ECLIPSE OF SEPTEMBER 10, 1923



Note :- The hours of beginning and ending are expressed in Greenwich Mean Time.

PATH OF TOTAL PHASE DURING THE ECLIPSE OF THE SUN,
SEPTEMBER 10, 1923.

Green- wich Mean Time.	Northern Limit.		Central Line.		Southern Limit.		Duration of Total Phase on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
Limits.	° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	m s
7 ^h 20 ^m	+48 45	-154 5	+48 16	-154 18	+47 47	-154 31	1 52.8
	49 45.9	-171 19.2	49 14.3	-173 4.1	48 41.6	-174 37.3	2 9.2
25	49 40.2	+176 53.1	49 2.4	+175 54.7	48 24.3	+175 0.9	2 21.7
30	+49 11.2	+169 2.2	+48 30.8	+168 23.0	+47 50.4	+167 46.8	2 32.3
35	48 32.5	162 53.2	47 50.6	162 26.4	47 8.8	162 1.9	2 41.6
40	47 48.0	157 45.7	47 5.2	157 28.1	46 22.7	157 12.2	2 49.9
45	46 59.7	153 20.6	46 16.5	153 10.3	45 33.5	153 1.3	2 57.4
50	46 8.9	149 26.3	45 25.5	149 22.0	44 42.3	149 18.7	3 4.1
55	45 16.2	145 56.4	44 32.8	145 57.2	43 49.6	145 58.8	3 10.2
8 0	+44 22.0	+142 46.2	+43 38.8	+142 51.2	+42 55.8	+142 56.9	3 15.6
5	43 26.7	139 51.7	42 43.7	140 0.4	42 0.9	140 9.6	3 20.4
10	42 30.6	137 10.2	41 47.9	137 22.2	41 5.4	137 34.6	3 24.6
15	41 33.8	134 39.8	40 51.5	134 54.6	40 9.4	135 9.8	3 28.1
20	40 36.4	132 18.5	39 54.5	132 35.8	39 12.8	132 53.4	3 31.0
25	39 38.6	130 4.7	38 57.1	130 24.4	38 15.8	130 44.2	3 33.4
30	+38 40.3	+127 57.5	+37 59.3	+128 19.3	+37 18.5	+128 41.1	3 35.1
35	37 41.7	125 55.8	37 1.2	126 19.4	36 20.8	126 43.0	3 36.3
40	36 42.8	123 58.6	36 2.8	124 23.8	35 22.9	124 49.0	3 36.9
45	35 43.5	122 4.9	35 4.1	122 31.6	34 24.7	122 58.2	3 36.9
50	34 44.1	120 14.1	34 5.1	120 42.1	33 26.2	121 10.0	3 36.3
55	33 44.2	118 25.2	33 5.8	118 54.5	32 27.5	119 23.6	3 35.1
9 0	+32 44.0	+116 37.5	+32 6.2	+117 8.0	+31 28.4	+117 38.2	3 33.3
5	31 43.6	114 50.5	31 6.3	115 22.0	30 29.0	115 53.2	3 31.0
10	30 42.6	113 3.2	30 5.9	113 35.7	29 29.2	114 7.9	3 28.1
15	29 41.2	111 14.9	29 5.1	111 48.4	28 29.0	112 21.5	3 24.6
20	28 39.3	109 24.6	28 3.9	109 59.0	27 28.4	110 33.0	3 20.5
25	27 36.9	107 31.1	27 2.1	108 6.6	26 27.2	108 41.6	3 15.9
30	+26 33.8	+105 33.6	+25 59.7	+106 10.1	+25 25.5	+106 46.0	3 10.6
35	25 29.9	103 30.7	24 56.5	104 8.2	24 23.0	104 45.1	3 4.7
40	24 25.0	101 20.7	23 52.4	101 59.3	23 19.6	102 37.3	2 58.1
45	23 18.9	99 1.0	22 47.2	99 41.0	22 15.2	100 20.2	2 50.8
50	22 11.3	96 28.5	21 40.5	97 10.1	21 9.4	97 50.8	2 42.6
55	21 1.9	93 38.8	20 32.1	94 22.4	20 1.9	95 5.0	2 33.4
10 0	+19 49.6	+ 90 24.0	+19 21.1	+ 91 10.5	+18 52.1	+ 91 55.9	2 22.9
5	18 33.4	86 30.9	18 6.4	87 21.9	17 38.9	88 11.6	2 10.4
10	17 10.2	81 28.5	16 45.4	82 28.7	16 20.1	83 26.5	1 53.1
15	15 28.7	73 19.7	15 9.3	74 53.6	14 48.4	76 18.4	...
Limits.	+14 13	+ 63 40	+13 43	+ 63 51	+13 13	+ 64 1	...

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, SEPT. 10, 1923.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magni- tude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
Albany, N. Y.	8 41	256	212	9 34	0.42	10 24	146	93
Allegheny, Pa.	8 36	262	218	9 35	0.49	10 29	142	92
Amherst, Mass.	8 43	256	211	9 36	0.42	10 25	146	98
Ann Arbor, Mich.	8 28	262	222	9 29	0.49	10 24	143	96
Appleton, Wis.	8 19	262	228	9 21	0.49	10 18	144	99
Atlanta, Ga.	8 36	272	222	9 43	0.64	10 43	133	77
Augusta, Me.	8 43	253	209	9 33	0.38	10 20	148	102
Austin, Tex.	8 17	286	243	9 35	0.83	10 45	125	66
Baton Rouge, La.	8 29	281	231	9 42	0.76	10 48	127	68
Berkeley, Calif.	7 17	293	310	8 42	0.95	10 4	121	85
Bismarck, N. Dak.	7 56	267	249	9 3	0.55	10 7	141	103
Boise City, Idaho	7 27	281	285	8 45	0.75	10 1	130	97
Buffalo, N. Y.	8 35	258	217	9 31	0.45	10 23	145	98
Cambridge, Mass.	8 44	255	210	9 36	0.42	10 25	146	98
Carson City, Nev.	7 22	289	301	8 45	0.89	10 5	124	88
Charleston, W. Va.	8 36	265	220	9 37	0.54	10 33	139	88
Charlottesville, Va.	8 40	264	216	9 40	0.53	10 34	140	87
Cheyenne, Wyo.	7 51	277	260	9 7	0.68	10 17	134	90
Cincinnati, Ohio	8 31	266	223	9 34	0.54	10 31	140	88
Cleveland, Ohio	8 32	262	220	9 32	0.49	10 26	143	94
Columbia, Mo.	8 18	271	234	9 26	0.61	10 29	137	87
Columbia, S. C.	8 41	270	219	9 45	0.62	10 43	134	78
Columbus, Ohio	8 32	264	221	9 33	0.52	10 29	141	91
Denver, Colo.	7 52	279	261	9 9	0.71	10 20	132	87
Des Moines, Iowa	8 13	269	237	9 20	0.57	10 23	139	92
Dover, Del.	8 43	261	214	9 40	0.49	10 32	142	90
Evanston, Ill.	8 22	264	227	9 26	0.52	10 24	142	94
Flagstaff, Ariz.	7 41	289	282	9 5	0.88	10 23	124	76
Geneva, N. Y.	8 37	258	215	9 32	0.44	10 23	145	98
Greencastle, Ind.	8 26	267	226	9 30	0.55	10 29	139	89
Hanover, N. H.	8 41	254	211	9 33	0.40	10 22	147	101
Harrisburg, Pa.	8 40	260	215	9 37	0.48	10 30	143	92
Helena, Mont.	7 34	274	272	8 48	0.65	9 59	136	103
Honolulu, Hawaii	6 49	343	51	7 39	0.22	8 33	63	120
Iowa City, Iowa	8 16	267	233	9 22	0.56	10 23	140	93
Ithaca, N. Y.	8 38	258	214	9 33	0.44	10 24	145	97
Jackson, Miss.	8 29	278	230	9 40	0.72	10 44	130	72
Juneau, Alaska	7 4	268	285	8 10	0.61	9 16	136	133
Kansas City, Mo.	8 13	272	238	9 23	0.62	10 28	136	87
Little Rock, Ark.	8 22	276	234	9 34	0.69	10 38	132	77
Louisville, Ky.	8 30	268	224	9 34	0.57	10 33	138	86
Madison, Wis.	8 19	264	230	9 22	0.52	10 21	142	96
Minneapolis, Minn	8 11	264	236	9 15	0.51	10 15	142	100
Montgomery, Ala.	8 35	275	225	9 44	0.68	10 45	131	73
Mount Hamilton, Calif.	7 19	293	310	8 44	0.96	10 6	120	84
Mount Wilson, Calif.	7 29	295	304	8 55	0.98	10 17	119	74
Nashville, Tenn.	8 30	271	226	9 37	0.62	10 37	135	82

LOCAL CIRCUMSTANCES OF THE ECLIPSE OF THE SUN, SEPT. 10, 1923.

Place.	Beginning.			Middle.		Ending.		
	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.	Greenwich Mean Time.	Magni- tude.	Greenwich Mean Time.	Angle from North Point.	Angle from Vertex.
	h m	°	°	h m		h m	°	°
New Haven, Conn. . . .	8 43	257	211	9 37	0.44	10 27	145	96
New Orleans, La. . . .	8 32	281	230	9 44	0.76	10 49	127	67
New York, N. Y. . . .	8 43	258	212	9 38	0.46	10 28	144	94
Nome, Alaska	6 49	264	288	7 47	0.60	8 47	134	149
Oklahoma City, Okla. . .	8 11	279	244	9 26	0.72	10 34	131	78
Omaha, Nebr.	8 9	270	241	9 18	0.60	10 22	138	91
Orono, Me.	8 44	252	208	9 33	0.37	10 19	149	104
Oxford, Miss.	8 28	275	229	9 37	0.67	10 40	133	77
Panama, Panama	9 16	304	221	10 20	0.82	11 18	100	18
Philadelphia, Pa. . . .	8 42	260	213	9 38	0.48	10 30	143	92
Phoenix, Ariz.	7 42	292	285	9 7	0.92	10 26	122	72
Pierre, S. Dak.	7 58	270	249	9 8	0.58	10 13	139	98
Portland, Oreg.	7 14	282	296	8 33	0.78	9 50	129	104
Poughkeepsie, N. Y. . .	8 42	258	212	9 36	0.44	10 26	145	96
Raleigh, N. C.	8 42	267	216	9 44	0.57	10 39	137	82
Richmond, Va.	8 42	264	215	9 41	0.53	10 36	139	86
Sacramento, Calif. . . .	7 18	291	306	8 42	0.92	10 4	122	87
Salt Lake City, Utah . .	7 37	282	278	8 56	0.77	10 11	130	90
San Juan, P. R.	9 13	284	212	10 13	0.89	. . . .	. . .	. . .
Santa Fe, N. Mex. . . .	7 53	285	265	9 14	0.80	10 28	127	77
Seattle, Wash.	7 15	278	291	8 31	0.74	9 46	131	108
Springfield, Ill.	8 22	268	230	9 28	0.57	10 28	139	89
St. Louis, Mo.	8 22	270	231	9 29	0.60	10 31	137	86
Syracuse, N. Y.	8 38	257	214	9 32	0.43	10 23	146	98
Tallahassee, Fla. . . .	8 40	276	222	9 48	0.71	10 50	129	69
Topeka, Kans.	8 11	273	240	9 22	0.64	10 27	136	86
Tuscaloosa, Ala.	8 32	275	226	9 41	0.68	10 43	132	75
Ukiah, Calif.	7 15	291	310	8 38	0.93	10 0	122	89
Urbana, Ill.	8 24	267	228	9 28	0.56	10 28	139	90
Washington, D. C. . . .	8 41	262	215	9 39	0.50	10 32	141	90
Williams Bay, Wis. . . .	8 21	264	228	9 24	0.52	10 22	142	95

564 STARS OCCULTED BY THE MOON, 1923.

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
80 B. Piscium	6.3	0 1 6.967	+0.0037	- 0 55 49.80	-0.052
4 Ceti	6.3	0 3 47.427	+0.0018	2 58 38.03	+0.009
5 Ceti	6.3	0 4 15.520	+0.0003	- 2 52 33.13	+0.014
98 B. Piscium	6.3	0 13 50.328	+0.0051	+ 1 15 38.69	+0.012
44 Piscium	6.0	0 21 27.283	-0.0014	+ 1 30 47.80	-0.023
10 Ceti	6.4	0 22 40.485	+0.0056	- 0 28 32.58	+0.011
155 B. Piscium	6.5	0 47 20.319	+0.0011	+ 2 58 1.93	-0.094
73 Piscium	6.2	1 0 53.183	+0.0022	5 14 38.23	-0.008
77 Piscium	6.4	1 1 50.066	+0.0011	4 29 55.63	-0.114
e Piscium	5.6	1 4 24.065	-0.0180	5 14 34.49	-0.171
f Piscium	5.3	1 13 49.546	-0.0033	+ 3 12 33.61	-0.026
μ Piscium	5.0	1 26 8.930	+0.0199	5 44 51.76	-0.027
ν Piscium	4.7	1 37 25.338	-0.0015	5 5 54.57	+0.003
39 B. Arietis	6.5	2 0 47.224	+0.0025	7 22 0.01	-0.032
64 Ceti	5.8	2 7 17.037	-0.0092	8 12 36.27	-0.107
ξ ¹ Ceti	4.5	2 8 54.975	-0.0012	+ 8 29 9.78	-0.016
ξ Arietis	5.5	2 20 41.193	+0.0006	10 15 45.03	-0.022
25 Arietis	6.5	2 23 17.509	-0.0195	9 51 26.38	-0.200
389 B. Ceti	6.3	2 25 28.491	-0.0003	9 13 21.27	-0.003
31 Arietis	5.7	2 32 25.780	+0.0189	12 6 52.20	-0.085
85 Ceti	6.3	2 38 19.976	-0.0026	+10 24 51.63	-0.012
38 Arietis	5.2	2 40 45.648	+0.0081	12 7 21.46	-0.079
μ Ceti	4.4	2 40 46.593	+0.0188	9 47 23.86	-0.025
147 B. Arietis	5.8	3 2 9.947	+0.0016	12 53 27.90	-0.072
8 B. Tauri	6.2	3 19 55.704	....	12 21 27.09	...
f Tauri	4.3	3 26 37.162	+0.0016	+12 40 25.80	+0.002
30 B. Tauri	6.4	3 33 28.328	+0.0015	15 10 44.32	-0.003
179 B. Tauri	5.9	4 3 20.385	+0.0104	14 57 27.39	-0.044
193 B. Tauri	6.2	4 8 6.060	+0.0005	17 4 49.90	-0.014
48 Tauri	6.3	4 11 23.873	+0.0085	15 12 33.02	-0.024
γ Tauri	3.9	4 15 24.550	+0.0083	+15 26 34.24	-0.026
58 Tauri	5.4	4 16 14.135	+0.0071	14 54 43.46	-0.017
δ Tauri	3.9	4 18 29.500	+0.0076	17 21 47.15	-0.030
63 Tauri	5.7	4 18 59.821	+0.0074	16 35 55.35	-0.027
64 Tauri	4.9	4 19 39.309	+0.0084	17 16 0.49	-0.040
70 Tauri	6.4	4 21 13.426	+0.0073	+15 45 58.24	-0.026
71 Tauri	4.6	4 21 57.344	+0.0075	15 26 40.96	-0.020
75 Tauri	5.2	4 24 2.122	+0.0002	16 11 19.05	+0.020
θ ¹ Tauri	4.2	4 24 10.385	+0.0071	15 47 32.99	-0.023
θ ² Tauri	3.6	4 24 15.845	+0.0078	15 42 4.93	-0.020
80 Tauri	5.8	4 25 44.968	+0.0059	+15 28 15.99	-0.011
264 B. Tauri	4.8	4 26 9.100	+0.0084	16 1 39.61	-0.027
81 Tauri	5.5	4 26 15.208	+0.0069	15 31 31.77	-0.032
85 Tauri	6.0	4 27 27.736	+0.0070	15 41 15.60	-0.020
119 H ¹ Tauri	6.2	4 29 5.442	+0.0025	17 51 18.97	-0.031
275 B. Tauri	6.5	4 29 13.595	+0.0010	+16 9 46.20	+0.019
α Tauri (<i>Aldebaran</i>) .	1.1	4 31 30.001	+0.0047	16 21 20.55	-0.189
89 Tauri	5.8	4 33 44.883	+0.0072	15 52 48.75	-0.023
σ ¹ Tauri	5.2	4 34 45.231	+0.0019	15 38 58.32	-0.065
σ ² Tauri	4.9	4 34 52.121	+0.0062	15 45 59.80	-0.019
318 B. Tauri	5.7	4 52 55.377	-0.0008	+17 2 2.83	-0.011
m Tauri	5.0	5 2 53.848	+0.0381	18 32 35.00	+0.025
111 Tauri	5.1	5 19 55.741	+0.0168	17 18 47.53	-0.010
115 Tauri	5.3	5 22 40.568	+0.0016	17 53 50.72	-0.021
117 Tauri	6.0	5 23 33.391	+0.0017	17 10 33.21	-0.078
119 Tauri	4.9	5 27 41.873	+0.0007	+18 32 17.77	-0.004
167 H ¹ Tauri	5.5	5 27 46.418	+0.0025	17 0 7.22	-0.040
120 Tauri	5.6	5 29 0.859	+0.0011	18 29 11.92	+0.001
122 Tauri	5.5	5 32 35.563	+0.0034	16 59 38.07	-0.037
130 Tauri	5.6	5 42 56.820	+0.0004	+17 42 5.42	-0.009

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
B. D. +19°1110 . . .	6.0	5 47 49.652	-0.0008	+19 50 56.71	-0.031
57 Orionis . . .	5.8	5 50 23.156	+0.0003	19 44 8.98	-0.013
64 Orionis . . .	5.1	5 58 53.907	+0.0014	19 41 35.14	-0.021
68 Orionis . . .	5.7	6 7 27.748	+0.0012	19 48 32.38	-0.013
19 B. Geminorum . . .	6.2	6 9 1.883	+0.0027	18 42 5.84	-0.042
124 H ¹ . Orionis . . .	5.7	6 9 58.785	+0.0010	+17 55 44.95	-0.045
71 Orionis . . .	5.1	6 10 19.068	-0.0062	19 11 1.73	-0.194
B. D. +17°1191 . . .	6.5	6 11 55.387	+0.0011	17 12 28.99	-0.031
287 B. Orionis . . .	6.2	6 14 33.120	-0.0031	17 21 23.44	-0.037
292 B. Orionis . . .	6.5	6 16 56.264	+0.0006	17 48 2.86	...
26 Geminorum . . .	5.2	6 37 55.378	+0.0010	+17 43 18.45	-0.092
74 B. Geminorum . . .	6.2	6 42 53.529	+0.0002	18 16 41.02	-0.056
110 B. Geminorum . . .	6.2	6 57 56.828	....	17 51 57.28	...
41 H ¹ . Geminorum . . .	6.0	6 58 6.698	-0.0063	16 47 11.29	+0.006
λ Geminorum . . .	3.6	7 13 40.171	-0.0029	16 40 49.62	-0.045
162 B. Geminorum . . .	5.7	7 27 22.075	+0.0018	+17 15 5.12	-0.065
f Geminorum . . .	5.3	7 35 1.871	-0.0002	17 51 4.30	+0.004
g Geminorum . . .	5.0	7 41 40.107	-0.0048	18 41 56.66	-0.063
1 Cancrī . . .	6.0	7 52 37.248	-0.0021	15 59 49.48	-0.044
2 B. Cancrī . . .	6.0	7 54 8.044	+0.0003	16 43 38.47	+0.004
3 Cancrī . . .	5.7	7 56 22.726	-0.0001	+17 31 14.65	-0.010
5 Cancrī . . .	5.9	7 57 7.102	+0.0004	16 40 7.68	0.000
30 B. Cancrī . . .	6.1	8 6 39.465	-0.0007	14 51 29.50	-0.013
ζ Cancrī (mean) . . .	4.7	8 7 47.905	+0.0051	17 52 52.41	-0.129
d ² Cancrī . . .	6.2	8 21 28.535	-0.0132	17 18 3.89	-0.153
29 Cancrī . . .	5.9	8 24 19.627	-0.0017	+14 27 59.80	-0.022
90 B. Cancrī . . .	6.3	8 31 48.776	+0.0006	15 34 51.01	-0.027
54 Cancrī . . .	6.3	8 46 44.318	-0.0075	15 38 14.01	+0.077
o ¹ Cancrī . . .	5.1	8 52 57.422	+0.0041	15 37 8.41	+0.022
o ² Cancrī . . .	5.7	8 53 17.339	+0.0043	15 52 40.55	+0.023
81 Cancrī . . .	6.4	9 8 4.925	-0.0359	+15 18 26.02	+0.244
π Cancrī . . .	5.6	9 10 58.993	-0.0022	15 15 42.49	-0.008
222 B. Cancrī . . .	6.3	9 13 41.291	+0.0046	11 49 27.77	-0.007
ξ Leonis . . .	5.1	9 27 47.866	-0.0063	11 38 29.73	-0.084
o Leonis . . .	3.8	9 37 2.597	-0.0096	10 14 36.48	-0.033
18 Leonis . . .	5.8	9 42 14.609	-0.0006	+12 9 55.20	+0.008
19 Leonis . . .	6.4	9 43 17.622	-0.0049	11 55 30.27	+0.008
R Leonis (var.) . . .	4.6	9 43 25.132	-0.0005	11 47 12.42	-0.040
83 B. Leonis . . .	5.9	9 52 21.103	-0.0074	9 17 55.47	+0.017
ν Leonis . . .	5.0	9 54 4.907	-0.0028	12 48 45.26	-0.027
A Leonis . . .	4.6	10 3 49.215	-0.0057	+10 22 31.94	-0.067
α Leonis (Regulus) . . .	1.3	10 4 16.407	-0.0169	12 20 38.76	-0.002
44 Leonis . . .	5.9	10 21 11.909	+0.0018	9 10 36.38	-0.041
45 Leonis . . .	5.8	10 23 35.100	+0.0011	10 9 19.75	-0.003
ρ Leonis . . .	3.8	10 28 45.526	-0.0004	9 42 12.08	-0.003
48 Leonis . . .	5.2	10 30 47.089	-0.0072	+ 7 21 1.84	+0.047
49 Leonis . . .	5.7	10 30 59.910	-0.0030	9 2 55.12	-0.010
37 Sextantis . . .	6.3	10 42 5.198	-0.0010	6 46 45.63	-0.040
56 Leonis . . .	6.1	10 52 1.681	-0.0013	6 35 48.18	-0.008
c Leonis . . .	5.1	10 56 45.400	-0.0035	6 30 55.89	-0.025
χ Leonis . . .	4.7	11 1 2.780	-0.0234	+ 7 45 9.85	-0.040
σ Leonis . . .	4.1	11 17 10.029	-0.0062	6 27 5.86	-0.013
80 Leonis . . .	6.4	11 21 52.692	-0.0051	4 17 3.00	-0.050
83 Leonis . . .	6.3	11 22 51.444	-0.0492	3 25 59.19	+0.187
τ Leonis . . .	5.2	11 23 58.670	+0.0008	3 16 49.80	-0.016
89 Leonis . . .	5.7	11 30 25.551	-0.0121	+ 3 29 16.83	-0.104
β Virginis . . .	3.8	11 46 41.062	+0.0494	2 11 55.45	-0.275
27 B. Virginis . . .	6.5	11 55 7.094	-0.0033	0 57 32.18	+0.034
10 Virginis . . .	6.2	12 5 44.597	+0.0034	+ 2 19 48.99	-0.181
13 Virginis . . .	5.9	12 14 43.415	+0.0019	- 0 21 33.39	-0.021

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.		Magni- tude.	Right Ascension.			Annual Proper Motion.	Declination.			Annual Proper Motion.
			h	m	s	s	°	'	"	"
η	Virginis . . .	4.0	12	15	57.985	-0.0036	- 0	14	20.45	-0.027
γ	Virginis (<i>mean</i>) . . .	2.9	12	37	45.530	-0.0365	1	1	38.25	+0.004
38	Virginis . . .	6.1	12	49	14.533	-0.0173	3	8	5.48	-0.004
91 G.	Virginis . . .	6.5	12	49	39.664	-0.0025	3	48	19.73	-0.070
k	Virginis . . .	5.7	12	55	41.441	-0.0027	3	23	49.05	-0.004
46	Virginis . . .	6.1	12	56	37.914	-0.0026	- 2	57	16.98	+0.046
48	Virginis . . .	6.5	12	59	56.262	-0.0033	3	14	56.57	-0.028
θ	Virginis . . .	4.4	13	5	57.657	-0.0029	5	7	41.85	-0.040
65	Virginis . . .	6.0	13	19	19.370	-0.0016	4	31	19.20	-0.016
66	Virginis . . .	5.7	13	20	32.612	+0.0105	4	45	43.08	-0.030
72	Virginis . . .	6.1	13	26	24.541	+0.0023	- 6	4	23.59	+0.014
l	Virginis . . .	4.8	13	27	57.574	-0.0069	5	51	31.13	-0.045
80	Virginis . . .	5.6	13	31	30.815	+0.0010	5	0	15.89	+0.075
m	Virginis . . .	5.2	13	37	34.075	-0.0073	8	18	53.93	+0.032
566 B.	Virginis . . .	6.4	13	39	53.669	-0.0049	5	6	41.58	-0.025
88	Virginis . . .	6.5	13	44	16.128	-0.0032	- 6	27	13.68	-0.033
598 B.	Virginis . . .	6.1	13	50	55.708	-0.0121	7	40	50.09	-0.049
623 B.	Virginis . . .	6.5	14	0	16.704	-0.0026	8	53	17.19	+0.006
95	Virginis . . .	5.4	14	2	38.308	-0.0098	8	56	47.58	+0.011
96	Virginis . . .	6.5	14	4	54.283	-0.0005	9	58	13.49	+0.016
κ	Virginis . . .	4.3	14	8	47.140	+0.0006	- 9	54	57.61	+0.132
2	Libræ . . .	6.3	14	19	16.824	-0.0014	11	21	47.08	-0.066
4 G.	Libræ . . .	6.5	14	20	32.399	-0.0046	11	19	14.45	-0.028
6 B.	Libræ . . .	6.2	14	32	53.858	-0.0591	11	58	42.43	+0.384
22 B.	Libræ . . .	6.4	14	43	42.623	+0.0013	12	30	59.26	-0.083
13	Libræ . . .	5.7	14	50	11.826	-0.0048	-11	35	6.09	-0.020
ξ^2	Libræ . . .	5.6	14	52	35.187	-0.0006	11	5	59.34	-0.001
17	Libræ . . .	6.4	14	54	2.848	-0.0019	10	50	46.93	-0.021
18	Libræ . . .	5.9	14	54	43.523	-0.0079	10	50	7.89	-0.077
130 B.	Libræ . . .	5.9	15	19	38.490	-0.0043	12	5	43.97	-0.038
γ	Libræ . . .	4.0	15	31	12.974	+0.0047	-14	32	1.05	+0.007
190 B.	Libræ . . .	6.5	15	39	5.613	-0.0009	14	47	50.50	-0.115
η	Libræ . . .	5.5	15	39	44.297	-0.0028	15	25	43.10	-0.079
195 B.	Libræ . . .	6.2	15	47	20.233	-0.0010	13	54	7.19	+0.001
θ	Libræ . . .	4.4	15	49	26.279	+0.0066	16	30	16.19	+0.119
202 B.	Libræ . . .	6.4	15	51	55.133	+0.0012	-14	10	26.85	-0.094
203 B.	Libræ . . .	6.2	15	52	13.250	+0.0047	14	36	17.10	...
48	Libræ . . .	4.6	15	53	52.496	-0.0004	14	3	29.70	-0.026
49	Libræ . . .	5.4	15	56	0.210	-0.0434	16	18	26.89	-0.391
91 B.	Scorpii . . .	6.1	16	11	30.542	...	14	39	25.95	...
98 B.	Scorpii . . .	6.1	16	14	39.604	+0.0032	-14	41	11.87	-0.018
ϕ	Ophiuchi . . .	4.4	16	26	43.733	-0.0039	16	26	44.90	-0.029
24	Scorpii . . .	5.0	16	37	7.022	-0.0017	17	35	39.47	-0.004
78 B.	Ophiuchi . . .	6.5	16	51	35.082	+0.0062	16	41	5.39	+0.024
90 B.	Ophiuchi . . .	6.5	16	55	15.042	-0.0047	18	7	47.62	-0.156
29	Ophiuchi . . .	6.4	16	57	20.872	-0.0024	-18	46	24.31	-0.020
125 B.	Ophiuchi . . .	6.2	17	3	46.430	-0.0007	17	30	29.87	-0.049
164 B.	Ophiuchi . . .	6.0	17	15	24.341	-0.0003	17	40	36.54	+0.001
192 B.	Ophiuchi . . .	6.3	17	20	6.503	+0.0016	18	22	30.68	+0.009
305 B.	Ophiuchi . . .	6.3	17	51	23.252	+0.0019	18	47	22.50	-0.003
6	Sagittarii . . .	6.5	17	56	54.674	+0.0005	-17	9	18.05	-0.004
32 G.	Sagittarii . . .	5.7	18	3	20.713	-0.0003	17	9	59.25	...
39 G.	Sagittarii . . .	6.3	18	6	40.857	-0.0027	19	51	29.80	-0.040
64 B.	Sagittarii . . .	6.1	18	10	59.303	...	18	41	10.66	...
6 B.	Scuti . . .	5.9	18	12	42.830	+0.0007	17	24	4.56	+0.013
52 G.	Sagittarii . . .	6.4	18	12	57.639	+0.0004	-18	29	32.53	-0.036
17 H ¹ .	Sagittarii . . .	6.4	18	14	11.904	...	18	39	1.31	...
Y	Sagittarii (<i>var.</i>) . . .	5.4	18	16	51.187	...	18	53	43.52	-0.001
85 B.	Sagittarii . . .	6.0	18	23	26.898	-0.0006	17	50	53.40	+0.006
95 B.	Sagittarii . . .	5.7	18	25	40.397	+0.0041	-18	46	42.90	-0.072

STARS OCCULTED BY THE MOON, 1923. 567

MEAN PLACES FOR 1923.0. (January 0^d.884, Greenwich).

Name of Star.	Magni- tude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ' "	"
100 B. Sagittarii . . .	5.0	18 26 55.571	-0.0012	-18 27 24.02	-0.026
171 B. Sagittarii . . .	6.1	18 58 32.284	0.0000	19 21 30.29	-0.035
173 B. Sagittarii . . .	6.4	18 58 35.793	+0.0020	19 12 54.72	. . .
187 B. Sagittarii . . .	6.4	19 2 38.133	+0.0036	18 51 29.30	-0.056
190 B. Sagittarii . . .	5.4	19 3 45.313	+0.0001	19 24 43.55	-0.003
195 B. Sagittarii . . .	6.3	19 5 15.755	+0.0019	-19 55 33.47	-0.050
<i>d</i> Sagittarii . . .	5.0	19 13 7.822	-0.0015	19 5 28.33	-0.017
226 B. Sagittarii . . .	6.4	19 17 6.467	+0.0002	19 22 45.85	+0.009
<i>p</i> Sagittarii . . .	4.0	19 17 12.480	-0.0020	17 59 36.35	+0.015
45 Sagittarii . . .	6.0	19 17 21.450	+0.0064	18 27 7.48	-0.082
266 B. Sagittarii . . .	6.1	19 31 56.788	+0.0003	-19 1 26.56	-0.009
267 B. Sagittarii . . .	5.8	19 32 35.394	+0.0011	18 24 11.47	-0.002
54 Sagittarii . . .	5.4	19 36 18.797	+0.0046	16 28 15.61	-0.047
<i>e</i> Sagittarii . . .	5.2	19 38 6.947	+0.0040	16 18 20.32	-0 015
<i>g</i> Sagittarii . . .	5.1	19 53 35.093	+0.0004	15 41 47.89	-0.081
16 B. Capricorni . . .	6.2	20 16 27.102	+0 0025	-15 1 42.95	+0.005
<i>β</i> Capricorni . . .	3.2	20 16 41.237	+0.0030	15 1 31.97	+0.007
31 B. Capricorni . . .	6.4	20 24 23.367	+0 0013	15 59 49.74	+0.019
27 G. Capricorni . . .	6.2	20 26 45.465	-0 0058	15 18 54.10	-0.092
45 B. Capricorni . . .	6.1	20 29 54.567	+0 0035	13 59 13.03	+0 060
47 B. Capricorni . . .	6.2	20 31 10.937	+0.0055	-16 47 29.02	-0.033
<i>τ</i> Capricorni . . .	5.2	20 34 58.147	+0.0006	15 13 32.73	-0 015
61 B. Capricorni . . .	5.9	20 36 13.127	-0.0032	16 23 56.30	+0.082
94 B. Capricorni . . .	5.7	20 53 22.179	+0.0046	16 19 42.26	+0 030
95 B. Capricorni . . .	5.9	20 54 26.254	. . . .	14 46 52.43	. . .
29 Capricorni . . .	5.5	21 11 29.267	+0.0016	-15 29 32.33	+0 004
53 B. Aquarii . . .	6.5	21 11 46.662	+0.0004	13 31 19.82	-0.039
18 Aquarii . . .	5.5	21 19 59.121	+0.0054	13 12 33.89	+0 007
72 B. Aquarii . . .	6.5	21 24 3.590	-0.0045	11 54 8.56	+0.008
137 B. Capricorni . . .	6.2	21 35 19.865	+0.0001	10 55 25.85	-0.010
<i>λ</i> Capricorni . . .	5.5	21 42 23.511	+0.0015	-11 43 18.14	-0.004
151 B. Capricorni . . .	6.1	21 45 31.467	-0.0009	13 4 56.36	+0 031
96 B. Aquarii . . .	6.5	21 49 29.094	-0.0001	10 40 29.20	+0.006
<i>e</i> Aquarii . . .	5.4	22 6 30.593	+0.0019	11 56 38.71	+0.020
<i>θ</i> Aquarii . . .	4.3	22 12 46.296	+0.0074	8 10 1.93	-0.018
150 B. Aquarii . . .	6.0	22 12 48.799	-0.0034	- 9 25 27.18	-0.005
<i>p</i> Aquarii . . .	5.3	22 16 8.916	+0.0008	8 12 30.53	-0.008
170 B. Aquarii . . .	6.0	22 19 29.991	+0.0012	7 35 2.50	+0.034
186 B. Aquarii . . .	6.1	22 27 16.166	+0 0129	6 56 55.62	-0.129
167 G. Aquarii . . .	6.3	22 34 19.640	+0.0010	8 17 52.33	+0.012
213 B. Aquarii . . .	6.5	22 39 1.444	+0.0014	- 8 42 52.67	+0.031
67 Aquarii . . .	6.4	22 39 13.085	+0.0015	7 21 59.10	-0.007
<i>λ</i> Aquarii . . .	3.8	22 48 35.896	+0.0002	7 59 23.03	+0.035
78 Aquarii . . .	6.3	22 50 33.576	-0.0017	7 36 51.29	-0.029
252 B. Aquarii . . .	5.8	22 51 11.298	-0.0003	5 23 53.43	+0.009
197 G. Aquarii . . .	6.3	22 53 18.017	-0.0024	- 5 13 18.85	+0.006
81 Aquarii . . .	6.4	22 57 23.587	-0.0015	7 28 29.60	-0.001
263 B. Aquarii . . .	6.1	22 57 32.656	+0.0007	5 7 32.38	+0.002
82 Aquarii . . .	6.4	22 58 32.825	0 0000	6 59 16.11	-0.034
<i>h</i> Aquarii . . .	5.4	23 1 8.917	+0.0081	8 6 34.49	+0.016
<i>φ</i> Aquarii . . .	4.4	23 10 20.091	+0 0015	- 6 27 51.79	-0.194
293 B. Aquarii . . .	5.5	23 11 36.287	-0.0011	3 54 58.59	+0.003
96 Aquarii . . .	5.7	23 15 24.436	+0.0128	5 32 42.76	-0.009
316 B. Aquarii . . .	6.5	23 16 16.347	+0.0191	4 20 19.40	-0.118
317 B. Aquarii . . .	6.3	23 16 42.742	-0.0099	6 19 43.38	-0.065
337 B. Aquarii . . .	6.4	23 25 33.260	+0.0121	- 4 57 7.75	-0.218
342 B. Aquarii . . .	6.5	23 27 32.928	+0.0124	4 30 29.31	-0.172
20 Piscium . . .	5.6	23 43 59.064	+0.0064	3 11 23.30	+0.002
24 Piscium . . .	6.1	23 48 58.261	+0.0051	3 34 59.42	-0.048
29 Piscium . . .	5.1	23 57 52.662	+0.0009	- 3 27 22.03	-0.012

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	<i>Y</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
		s	"	° '						°	°
111 Tauri	5.1	+1.30	-9.1	+17 18.6	1 0 17.9	-10 21.7	+0.8325	0.5739	+0.0371	+90	+28
115 Tauri	5.3	1.30	9.1	17 53.7	1 30.1	-9 12.0	+0.2572	0.5744	0.0350	+51	-5
117 Tauri	6.0	1.30	9.2	17 10.4	1 53.2	-8 49.6	+1.0340	0.5746	0.0344	+90	+43
119 Tauri	4.9	1.31	9.2	18 32.1	3 41.8	-7 4.9	-0.3478	0.5753	0.0312	+15	-39
120 Tauri	5.6	1.31	9.2	18 29.0	4 16.2	-6 31.6	-0.2757	0.5755	0.0301	+19	-35
130 Tauri	5.6	+1.32	-9.7	+17 41.9	10 19.3	-0 41.6	+0.7020	0.5779	+0.0192	+90	+22
19 B. Geminorum	6.2	1.34	10.3	18 41.9	21 32.2	+10 7.0	-0.2499	0.5815	-0.0015	+20	-30
124 H ¹ . Orionis	5.7	1.33	10.4	17 55.6	21 56.6	+10 30.6	+0.5590	0.5816	0.0022	+75	+15
71 Orionis	5.1	1.34	10.3	19 10.9	22 5.2	+10 38.9	-0.7562	0.5816	0.0025	-9	-71
287 B. Orionis	6.2	1.33	10.5	17 21.2	23 53.7	-11 36.6	+1.1502	0.5821	0.0059	+90	+56
292 B. Orionis	6.5	+1.33	-10.6	+17 47.9	2 0 54.7	-10 37.8	+0.6776	0.5823	-0.0078	+90	+21
26 Geminorum	5.2	1.32	11.0	17 43.1	9 49.6	-2 2.3	+0.6132	0.5842	0.0246	+81	+16
74 B. Geminorum	6.2	1.32	11.1	18 16.5	11 55.8	-0 0.7	-0.0227	0.5846	0.0286	+33	-19
110 B. Geminorum	6.2	1.30	11.4	17 51.8	18 17.2	+6 6.6	+0.1856	0.5855	0.0406	+46	-9
λ Geminorum	3.6	1.28	11.5	16 40.6	3 0 54.6	-11 30.7	+1.1031	0.5860	0.0531	+90	+47
162 B. Geminorum	5.7	+1.26	-11.7	+17 14.9	6 40.4	-5 57.6	+0.1743	0.5862	-0.0637	+45	-12
f Geminorum	5.3	1.25	11.8	17 50.9	9 53.7	-2 51.4	-0.6598	0.5862	0.0696	-3	-67
1 Cancri	6.0	1.21	11.8	15 59.6	17 17.6	+4 16.1	+0.6873	0.5859	0.0828	+90	+15
2 B. Cancri	6.0	1.21	11.8	16 43.4	17 55.8	+4 52.8	-0.1176	0.5859	0.0840	+28	-30
3 Cancri	5.7	1.20	11.9	17 31.0	18 52.4	+5 47.4	-1.0140	0.5859	0.0856	-27	-73
5 Cancri	5.9	+1.20	-11.9	+16 39.9	19 11.1	+6 5.5	-0.1642	0.5858	-0.0862	+25	-33
29 Cancri	5.9	1.14	11.6	14 27.8	4 6 39.5	-6 51.4	+0.9947	0.5846	0.1055	+90	+33
90 B. Cancri	6.3	1.12	11.7	15 34.7	9 49.4	-3 48.5	-0.4892	0.5841	0.1106	+7	-57
54 Cancri	6.3	1.07	11.6	15 38.0	16 9.0	+2 17.2	-1.2764	0.5830	0.1204	-58	-75
222 B. Cancri	6.3	1.00	10.7	11 49.3	5 3 38.0	-10 38.9	+1.1371	0.5807	0.1368	+90	+42
ξ Leonis	5.1	+0.94	-10.4	+11 38.3	9 40.9	-4 49.1	+0.4711	0.5793	-0.1446	+65	-4
σ Leonis	3.8	0.91	9.9	10 14.4	13 39.5	-0 59.2	+1.3081	0.5783	0.1494	+79	+67
18 Leonis	5.8	0.88	10.2	12 9.8	15 54.1	+1 10.6	-0.9845	0.5778	0.1520	-23	-78
19 Leonis	6.4	0.88	10.2	11 55.3	16 21.3	+1 36.9	-0.8092	0.5777	0.1525	-11	-79
R Leonis (var.)	4.6	0.88	10.2	11 47.0	16 24.5	+1 40.0	-0.6768	0.5777	0.1526	-3	-77
83 B. Leonis	5.9	+0.86	-9.4	+9 17.8	20 16.2	+5 23.3	+1.2540	0.5768	-0.1569	+90	+53
Δ Leonis	4.6	0.81	9.4	10 22.4	6 1 14.7	+10 11.3	-0.6333	0.5756	0.1619	0	-74
44 Leonis	5.9	0.74	8.6	9 10.5	8 49.1	-6 30.5	-0.6700	0.5738	0.1690	-2	-79
48 Leonis	5.2	0.72	7.8	7 20.9	13 0.9	-2 27.6	+0.4657	0.5729	0.1724	+64	-7
49 Leonis	5.7	0.70	8.3	9 2.8	13 6.5	-2 22.1	-1.2718	0.5729	0.1724	-52	-81
37 Sextantis	6.3	+0.67	-7.3	+6 46.6	17 58.5	+2 19.6	+0.1802	0.5719	-0.1760	+45	-23
56 Leonis	6.1	0.63	7.0	6 35.7	22 21.2	+6 33.0	-0.4115	0.5710	0.1788	+12	-59
c Leonis	5.1	0.61	6.8	6 30.8	7 0 26.3	+8 33.7	-0.7034	0.5707	0.1800	-4	-84
80 Leonis	6.4	0.51	5.2	4 17.0	11 33.6	+4 42.3	-0.4769	0.5688	0.1852	+9	-65
83 Leonis	6.3	0.52	4.9	3 25.9	11 59.7	+4 17.1	+0.3040	0.5688	0.1854	+53	-18
τ Leonis	5.2	+0.51	-4.8	+3 16.8	12 29.5	-3 48.3	+0.3662	0.5687	-0.1856	+57	-14
89 Leonis	5.7	0.48	4.7	3 29.2	15 21.4	-1 2.4	-0.3767	0.5684	0.1864	+14	-58
β Virginis	3.8	0.41	3.7	2 11.9	22 35.5	+5 56.6	-0.4275	0.5676	0.1880	+11	-61
27 B. Virginis	6.5	0.38	2.9	+0 57.5	8 2 21.1	+9 34.5	+0.1191	0.5674	0.1886	+42	-28
13 Virginis	5.9	0.30	1.7	-0 21.6	11 5.8	-5 59.0	-0.1974	0.5670	0.1887	+24	-46
η Virginis	4.0	+0.29	-1.7	-0 14.4	11 39.1	-5 26.9	-0.4238	0.5670	-0.1887	+11	-61
38 Virginis	6.1	0.14	+0.6	3 8.1	9 2 29.7	+8 52.9	-0.2735	0.5673	0.1855	+19	-51
91 G. Virginis	6.5	0.15	0.9	3 48.3	2 40.9	+9 3.6	+0.3712	0.5673	0.1855	+57	-14
k Virginis	5.7	0.12	0.9	3 23.8	5 22.0	+11 39.2	-0.5393	0.5675	0.1844	+5	-70
46 Virginis	6.1	0.10	0.8	2 57.3	5 47.1	-11 56.5	-1.0645	0.5676	0.1842	-29	-90
48 Virginis	6.5	+0.09	+1.0	-3 14.9	7 15.4	-10 31.3	-1.0371	0.5677	-0.1836	-27	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
			$\Delta\alpha$	$\Delta\delta$									
			s	"	° ' "	d h m	h m				°	°	
θ	Virginis	4.4	+0.08	+ 1.9	5 7.7	9 9 56.2	- 7 56.2	+0.3768	0.5679	-0.1824	+57	-14	
	SATURN	0.9	...	...	5 27.0	14 43.2	- 3 19.1	-0.1637	0.5672	0.1796	+25	-44
65	Virginis	6.0	-0.00	2.2	4 31.3	15 52.2	- 2 12.5	-1.3114	0.5686	0.1793	-60	-84	
66	Virginis	5.7	0.00	2.3	4 45.7	16 24.6	- 1 41.2	-1.1651	0.5687	0.1789	-39	-90	
72	Virginis	6.1	-0.02	3.0	6 4.3	19 0.6	+ 0 49.3	-0.2986	0.5690	0.1773	+17	-53	
l	Virginis	4.8	-0.03	+ 3.0	5 51.5	19 41.8	+ 1 29.0	-0.6380	0.5691	-0.1769	- 2	-81	
m	Virginis	5.2	0.06	4.2	8 18.8	23 56.7	+ 5 35.0	+1.1086	0.5698	0.1740	+82	+33	
88	Virginis	6.5	0.12	3.7	6 27.2	10 2 54.2	+ 8 26.3	-1.2917	0.5703	0.1718	-57	-88	
598 B.	Virginis	6.1	0.14	4.4	7 40.8	5 50.2	+11 16.2	-0.5471	0.5708	0.1694	+ 2	-70	
623 B.	Virginis	6.5	0.18	5.1	8 53.2	9 56.8	- 8 46.0	-0.0101	0.5716	0.1659	+31	-35	
95	Virginis	5.4	-0.19	+ 5.2	8 56.7	10 58.9	- 7 46.0	-0.1220	0.5718	-0.1649	+25	-42	
96	Virginis	6.5	0.19	5.6	9 58.1	11 58.6	- 6 48.4	+0.7549	0.5720	0.1640	+81	+ 8	
κ	Virginis	4.3	0.22	5.7	9 54.9	13 40.6	- 5 10.1	+0.4221	0.5724	0.1625	+58	-11	
2	Libræ	6.3	0.26	6.5	11 21.7	18 15.8	+ 0 44.6	+1.1589	0.5734	0.1579	+79	+38	
4 G.	Libræ	6.5	0.27	6.5	11 19.1	18 48.8	- 0 12.7	+1.0292	0.5734	0.1573	+79	+27	
6 B.	Libræ	6.2	-0.33	+ 7.0	-11 58.6	11 0 11.6	+ 4 58.6	+0.8684	0.5747	-0.1515	+79	+15	
22 B.	Libræ	6.4	0.39	7.5	12 30.9	4 53.0	+ 9 30.0	+0.7190	0.5758	0.1460	+78	+ 6	
13	Libræ	5.7	0.43	7.4	11 35.0	7 41.3	-11 47.7	-0.6351	0.5765	0.1426	- 6	-81	
ξ^2	Libræ	5.6	0.44	7.2	11 5.9	8 43.2	-10 48.1	-1.2763	0.5767	0.1413	-59	-88	
γ	Libræ	4.0	0.63	9.0	14 31.9	12 1 17.4	+ 5 10.2	+0.0701	0.5806	0.1184	+31	-31	
190 B.	Libræ	6.5	-0.66	+ 9.1	-14 47.7	4 38.7	+ 8 24.2	-0.0489	0.5814	-0.1133	+24	-38	
η	Libræ	5.5	0.67	9.3	15 25.6	4 55.1	+ 8 40.0	+0.5661	0.5815	0.1129	+63	- 3	
θ	Libræ	4.4	0.71	9.7	16 30.1	9 2.3	-11 21.8	+1.2164	0.5823	0.1064	+74	+48	
202 B.	Libræ	6.4	0.73	9.1	14 10.3	10 5.4	-10 21.0	-1.2819	0.5826	0.1048	-66	-81	
203 B.	Libræ	6.2	0.73	9.2	14 36.1	10 13.0	-10 13.7	-0.8541	0.5826	0.1046	-23	-90	
49	Libræ	5.4	-0.75	+ 9.7	-16 18.3	11 49.2	- 8 41.1	+0.7252	0.5829	-0.1020	+74	+ 7	
ϕ	Ophiuchi	4.4	0.89	9.8	16 26.6	13 0 47.0	+ 3 48.2	-0.3139	0.5850	0.0800	+ 6	-54	
	VENUS	4.3	...	...	17 16.0	0 49.4	+ 3 50.4	+0.5324	0.5544	0.0746	+57	- 5
24	Scorpii	5.0	0.94	10.0	17 35.5	5 8.9	+ 8 0.4	+0.5352	0.5856	0.0722	+57	- 4	
78 B.	Ophiuchi	6.5	1.00	9.7	16 40.9	11 13.2	-10 8.8	-0.8072	0.5862	0.0612	-25	-90	
90 B.	Ophiuchi	6.5	-1.02	+10.0	-18 7.6	12 45.5	- 8 39.8	+0.5907	0.5863	-0.0584	+60	- 1	
29	Ophiuchi	6.4	1.03	10.1	18 46.2	13 38.2	- 7 49.1	+1.2042	0.5864	0.0568	+72	+48	
125 B.	Ophiuchi	6.2	1.05	9.8	17 30.3	16 19.8	- 5 13.5	-0.2473	0.5865	0.0518	+ 7	-50	
164 B.	Ophiuchi	6.0	1.10	9.6	17 40.4	21 12.3	- 0 31.8	-0.3037	0.5866	0.0426	+ 3	-54	
192 B.	Ophiuchi	6.3	1.12	9.7	18 22.4	23 10.6	+ 1 22.1	+0.3383	0.5866	0.0389	+39	-16	
305 B.	Ophiuchi	6.3	-1.23	+ 9.2	-18 47.2	14 12 18.3	- 9 59.4	+0.4230	0.5859	-0.0139	+43	-11	
NEW MOON.													
137 B.	Capricorni	6.2	-1.21	+ 0.6	-10 55.4	18 16 4.6	- 9 40.6	-0.8380	0.5462	+0.1393	-18	-90	
λ	Capricorni	5.5	1.20	+ 0.1	11 43.3	19 30.3	- 6 21.4	+0.5070	0.5445	0.1423	+63	- 6	
96 B.	Aquarii	6.5	-1.17	- 0.1	-10 40.5	22 58.2	- 3 0.0	-0.1272	0.5428	+0.1453	+24	-42	
θ	Aquarii	4.3	1.06	0.7	8 10.0	19 10 29.5	+ 8 9.8	-1.1249	0.5374	0.1540	-37	-90	
150 B.	Aquarii	6.0	1.08	1.0	9 25.5	10 30.7	+ 8 11.0	+0.2455	0.5374	0.1540	+46	-21	
ρ	Aquarii	5.3	1.05	0.9	8 12.5	12 10.8	+ 9 48.1	-0.8194	0.5366	0.1552	-14	-90	
170 B.	Aquarii	6.0	1.04	0.9	7 35.1	13 51.7	+11 25.9	-1.2381	0.5359	0.1563	-49	-90	
186 B.	Aquarii	6.1	-1.00	- 1.1	- 6 56.9	17 46.4	- 8 46.5	-1.3158	0.5342	+0.1586	-64	-81	
167 G.	Aquarii	6.3	1.00	1.7	8 17.9	21 20.9	- 5 18.5	+0.7264	0.5327	0.1606	+82	+ 6	
67	Aquarii	6.4	0.96	1.8	7 22.0	23 50.2	- 2 53.7	+0.1106	0.5317	0.1619	+39	-28	
78	Aquarii	6.3	0.92	2.4	7 36.9	20 5 38.4	+ 24.2	+1.3306	0.5295	0.1646	+74	+68	
252 B.	Aquarii	5.8	0.89	1.9	5 23.9	5 57.8	+ 3 3.0	-1.0421	0.5294	0.1647	-28	-90	
197 G.	Aquarii	6.3	-0.88	- 1.9	- 5 13.3	7 2.9	+ 4 6.2	-1.0563	0.5290	+0.1652	-30	-90	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
263 B. Aquarii	6.1	-0.86	-2.1	5 7.6	20 9 14.1	+ 6 13.5	-0.8000	0.5283	+0.1661	-12	-90
82 Aquarii	6.4	0.88	2.6	6 59.3	9 45.1	+ 6 43.6	+1.3267	0.5281	0.1663	+78	+64
293 B. Aquarii	5.5	0.79	2.4	3 55.0	16 31.2	-10 42.3	-0.9089	0.5259	0.1686	-18	-90
96 Aquarii	5.7	0.80	3.0	5 32.8	18 30.0	- 8 47.0	+1.2148	0.5253	0.1691	+85	+43
316 B. Aquarii	6.5	0.78	2.8	4 20.4	18 57.1	- 8 20.7	-0.0344	0.5251	0.1692	+32	-37
342 B. Aquarii	6.5	-0.73	-3.3	4 30.5	21 0 51.0	- 2 37.1	+1.1556	0.5236	+0.1706	+86	+37
20 Piscium	5.6	0.64	3.7	3 11.4	9 30.0	+ 5 47.0	+1.1887	0.5216	0.1720	+87	+40
80 B. Piscium	6.3	0.53	3.8	0 55.9	18 34.4	- 9 24.3	+0.2605	0.5200	0.1725	+50	-20
MARS	1.2	...	...	0 3.4	19 32.9	- 8 27.5	-0.5376	0.4902	0.1587	+ 5	-70
98 B. Piscium	6.3	0.44	3.6	+ 1 15.6	22 1 20.2	- 2 50.1	-0.9944	0.5192	0.1723	-23	-89
44 Piscium	6.0	-0.40	-3.9	+ 1 30.7	5 23.5	+ 1 6.3	-0.5757	0.5189	+0.1720	+ 3	-74
155 B. Piscium	6.5	0.25	4.5	2 58.0	19 11.3	- 9 29.5	+0.1732	0.5186	0.1694	+45	-25
73 Piscium	6.2	0.16	4.2	5 14.6	23 2 24.1	- 2 29.2	-1.1318	0.5190	0.1674	-35	-85
77 Piscium	6.4	0.16	4.6	4 29.9	2 54.3	- 1 59.8	-0.2225	0.5190	0.1673	-22	-47
e Piscium	5.6	0.14	4.4	5 14.5	4 16.2	- 0 40.3	-0.8182	0.5191	0.1668	-12	-85
μ Piscium	5.0	-0.02	-5.1	+ 5 44.8	15 47.7	+10 31.4	+0.5204	0.5206	+0.1622	+69	- 5
64 Ceti	5.8	+0.23	5.8	8 12.5	24 13 19.4	+ 7 25.4	+1.1649	0.5258	0.1499	+90	+41
ξ^1 Ceti	4.5	0.24	5.8	8 29.1	14 10.1	+ 8 14.6	+0.9866	0.5261	0.1493	+90	+26
ξ Arietis	5.5	0.32	5.6	10 15.7	20 14.0	- 9 52.3	-0.0795	0.5281	0.1449	+30	-36
25 Arietis	6.5	0.33	5.9	9 51.3	21 34.1	- 8 34.6	+0.5596	0.5285	0.1439	+73	0
31 Arietis	5.7	+0.40	-5.4	+12 6.8	25 2 14.1	- 4 2.8	-1.2610	0.5302	+0.1402	-52	-78
85 Ceti	6.3	0.42	6.2	10 24.8	5 14.0	- 1 8.3	+1.0247	0.5314	0.1376	+90	+31
38 Arietis	5.2	0.45	5.7	12 7.3	6 27.8	+ 0 3.3	-0.6835	0.5319	0.1366	- 4	-77
147 B. Arietis	5.8	0.56	6.3	12 53.4	17 12.2	+10 27.9	-0.1105	0.5365	0.1266	+28	-35
30 B. Tauri	6.4	0.74	6.6	15 10.6	26 8 34.4	+ 1 21.3	-0.7835	0.5439	0.1100	-10	-75
179 B. Tauri	5.9	+0.88	-7.8	+14 57.3	22 51.1	- 8 49.5	+0.9017	0.5514	+0.0921	+90	+27
193 B. Tauri	6.2	0.92	7.3	17 4.7	27 1 5.6	- 6 39.3	-1.1891	0.5526	0.0891	-44	-73
48 Tauri	6.3	0.92	8.0	15 12.4	2 38.4	- 5 9.6	+0.9675	0.5534	0.0870	+90	+33
γ Tauri	3.9	0.94	8.0	15 26.4	4 30.9	- 3 20.8	+0.8753	0.5544	0.0843	+90	+26
δ Tauri	3.9	0.97	7.5	17 21.7	5 57.1	- 1 57.4	-1.0745	0.5552	0.0823	-32	-73
63 Tauri	5.7	+0.97	-7.8	+16 35.8	6 11.2	- 1 43.8	-0.2315	0.5553	+0.0820	+22	-37
64 Tauri	4.9	0.98	7.6	17 15.9	6 29.6	- 1 26.0	-0.9260	0.5555	0.0816	-21	-73
70 Tauri	6.4	0.97	8.1	15 45.8	7 13.3	- 0 43.7	+0.7491	0.5558	0.0806	+90	+19
71 Tauri	4.6	0.97	8.3	15 26.5	7 33.7	- 0 24.1	+1.1222	0.5560	0.0800	+90	+46
75 Tauri	5.2	0.98	8.1	16 11.2	8 31.6	+ 0 31.9	+0.3978	0.5565	0.0786	+60	- 1
θ^1 Tauri	4.2	+0.98	-8.2	+15 47.4	8 35.4	+ 0 35.6	+0.8289	0.5566	+0.0786	+90	+24
θ^2 Tauri	3.6	0.98	8.3	15 41.9	8 37.9	+ 0 38.0	+0.9304	0.5566	0.0785	+90	+31
80 Tauri	5.8	0.98	8.4	15 28.1	9 19.2	+ 1 17.9	+1.2313	0.5570	0.0775	+90	+59
264 B. Tauri	4.8	0.99	8.2	16 1.5	9 30.4	+ 1 28.8	+0.6471	0.5571	0.0772	+84	+13
81 Tauri	5.5	0.99	8.4	15 31.4	9 33.2	+ 1 31.5	+1.1907	0.5571	0.0772	+90	+54
85 Tauri	6.0	+0.99	-8.4	+15 41.1	10 6.7	+ 2 3.9	+1.0588	0.5574	+0.0764	+90	+41
119 H ¹ Tauri	6.2	1.02	7.8	17 51.2	10 51.8	+ 2 47.5	-1.2139	0.5578	0.0753	-49	-73
275 B. Tauri	6.5	1.00	8.3	16 9.6	10 55.6	+ 2 51.2	+0.6095	0.5578	0.0752	+80	+11
α Tauri (Aldebar.)	1.1	1.02	8.3	16 21.2	11 58.4	+ 3 51.9	+0.4799	0.5584	0.0736	+67	+ 4
89 Tauri	5.8	1.02	8.5	15 52.7	13 0.4	+ 4 51.8	+1.0654	0.5590	0.0721	+90	+42
σ^2 Tauri	4.9	+1.02	-8.6	+15 45.9	13 31.3	+ 5 21.6	+1.2240	0.5593	+0.0713	+90	+59
318 B. Tauri	5.7	1.11	8.8	17 1.9	21 44.8	-10 41.5	+0.3980	0.5636	0.0586	+60	+ 1
m Tauri	5.0	1.16	8.7	18 32.4	28 2 14.3	- 6 21.3	-0.9639	0.5660	0.0514	-24	-72
111 Tauri	5.1	1.21	9.6	17 18.6	9 49.7	+ 0 58.4	+0.6868	0.5699	0.0387	+90	+19
115 Tauri	5.3	1.22	9.5	17 53.7	11 2.6	+ 2 8.6	+0.1127	0.5704	0.0367	+41	-13
117 Tauri	6.0	+1.22	-9.7	+17 10.4	11 25.9	+ 2 31.1	+0.8917	0.5706	+0.0360	+90	+32

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
119 Tauri	4.9	+1.24	-9.5	+18 32.1	28 13 15.5	+ 4 16.9	-0.4890	0.5715	+0.0329	+ 7	-50
167 H ¹ Tauri	5.5	1.23	9.9	17 0 0	13 17.5	+ 4 18.8	+1.1388	0.5715	0.0328	+90	+52
120 Tauri	5.6	1.24	9.6	18 29.0	13 50.2	+ 4 50.4	-0.4155	0.5718	0.0319	+11	-44
122 Tauri	5.5	1.24	10.0	16 59.5	15 24.6	+ 6 21.5	+1.2115	0.5726	0.0291	+90	+61
130 Tauri	5.6	1.28	10.2	17 41.9	19 56.2	+10 43.5	+0.5756	0.5746	0.0211	+76	+14
19 B. Geminorum	6.2	+1.36	-10.6	+18 41.9	29 7 12.8	- 2 24.3	-0.3532	0.5794	+0.0006	+15	-37
124 H ¹ Orionis	5.7	1.35	10.8	17 55.6	7 37.2	- 2 0.7	+0.4561	0.5796	-0.0002	+65	+10
71 Orionis	5.1	1.36	10.6	19 10.9	7 45.9	- 1 52.3	-0.8580	0.5797	0.0004	-16	-71
B. D. +17°1191	6.5	1.35	11.0	17 12.3	8 27.2	- 1 12.5	+1.2100	0.5799	0.0017	+90	+63
287 B. Orionis	6.2	1.36	11.1	17 21.2	9 34.7	- 0 7.5	+1.0508	0.5804	0.0038	+90	+47
292 B. Orionis	6.5	+1.37	-11.0	+17 47.9	10 35.9	+ 0 51.4	+0.5809	0.5807	-0.0057	+77	+16
26 Geminorum	5.2	1.41	11.6	17 43.1	19 31.1	+ 9 27.2	+0.5349	0.5838	0.0225	+72	+12
74 B. Geminorum	6.2	1.43	11.6	18 16.5	21 37.1	+11 28.6	-0.0950	0.5844	0.0265	+29	-23
110 B. Geminorum	6.2	1.45	12.0	17 51.8	30 3 57.3	- 6 25.3	+0.1265	0.5862	0.0385	+42	-12
41 H ¹ Geminorum	6.0	1.44	12.1	16 47.0	4 1.5	- 6 21.1	+1.2410	0.5862	0.0387	+88	+65
λ Geminorum	3.6	+1.46	-12.4	+16 40.6	10 32.4	- 0 4.8	+1.0543	0.5877	-0.0509	+90	+43
162 B. Geminorum	5.7	1.48	12.5	17 14.9	16 15.4	+ 5 25.4	+0.1424	0.5887	0.0618	+43	-13
f Geminorum	5.3	1.49	12.6	17 50.9	19 26.8	+ 8 29.7	-0.6797	0.5891	0.0677	- 4	-69
1 Cancr	6.0	1.49	13.0	15 59.6	31 2 45.2	- 8 28.2	+0.6751	0.5899	0.0812	+89	+14
2 B. Cancr	6.0	1.49	12.9	16 43.4	3 22.9	- 7 52.0	-0.1228	0.5899	0.0823	+28	-30
3 Cancr	5.7	+1.50	-12.9	+17 31.0	4 18.8	- 6 58.2	-1.0104	0.5900	-0.0840	-27	-73
5 Cancr	5.9	1.49	13.0	16 39.9	4 37.2	- 6 40.4	-0.1661	0.5900	0.0845	+25	-33
29 Cancr	5.9	1.49	13.3	14 27.8	15 54.2	+ 4 11.1	+1.0080	0.5903	0.1043	+90	+34
90 B. Cancr	6.3	+1.49	-13.2	+15 34.6	19 0.4	+ 7 10.4	-0.4553	0.5902	-0.1095	+ 9	-54

FEBRUARY.

54 Cancr	6.3	+1.48	-13.3	+15 38.0	1 1 12.0	-10 51.8	-1.2203	0.5899	-0.1196	-48	-75
222 B. Leonis	6.3	1.46	13.2	11 49.2	12 24.6	- 0 4.4	+1.1915	0.5888	0.1365	+90	+48
ξ Leonis	5.1	1.44	13.0	11 38.3	18 18.0	+ 5 35.8	+0.5454	0.5880	0.1447	+72	+ 1
18 Leonis	5.8	+1.41	-12.9	+12 9.7	2 0 20.7	+11 25.1	-0.8790	0.5870	-0.1524	-16	-78
19 Leonis	6.4	1.41	12.9	11 55.3	0 47.1	+11 50.5	-0.7050	0.5869	0.1530	- 5	-78
R Leonis (var.)	4.6	1.41	12.8	11 47.0	0 50.3	+11 53.6	-0.5742	0.5869	0.1530	+ 3	-68
A Leonis	4.6	1.38	12.5	10 22.3	9 24.8	- 3 50.9	-0.5134	0.5854	0.1628	+ 6	-64
44 Leonis	5.9	1.35	12.0	9 10.4	16 45.2	+ 3 13.4	-0.5353	0.5840	0.1701	+ 5	-67
48 Leonis	5.2	+1.33	-11.5	+ 7 20.8	20 49.0	+ 7 8.2	+0.5922	0.5832	-0.1736	+76	0
49 Leonis	5.7	1.32	11.8	9 2.7	20 54.4	+ 7 13.4	-1.1208	0.5832	0.1737	-34	-81
37 Sextantis	6.3	1.31	11.2	6 46.6	3 1 37.1	+11 45.9	+0.3192	0.5823	0.1774	+54	-15
56 Leonis	6.1	1.28	10.9	6 35.6	5 51.3	- 8 9.1	-0.2566	0.5815	0.1804	+20	-48
c Leonis	5.1	1.27	10.8	6 30.8	7 52.4	- 6 12.5	-0.5410	0.5811	0.1817	+ 5	-69
80 Leonis	6.4	+1.21	- 9.6	+ 4 16.9	18 38.3	+ 4 10.1	-0.3010	0.5792	-0.1871	+18	-52
83 Leonis	6.3	1.21	9.4	3 25.8	19 3.5	+ 4 34.3	+0.4695	0.5791	0.1873	+65	- 8
τ Leonis	5.2	1.21	9.3	3 16.7	19 32.4	+ 5 2.2	+0.5316	0.5790	0.1874	+70	- 5
89 Leonis	5.7	1.19	9.2	3 29.1	22 18.9	+ 7 42.7	-0.1970	0.5785	0.1884	+24	-46
β Virginis	3.8	1.15	8.3	2 11.8	4 5 19.5	- 9 31.8	-0.2380	0.5775	0.1901	+21	-48
27 B. Virginis	6.5	+1.13	- 7.7	+ 0 57.4	8 58.2	- 6 0.9	+0.3057	0.5770	-0.1906	+53	-18
13 Virginis	5.9	1.07	6.7	0 21.7	17 27.8	+ 2 10.5	+0.0024	0.5760	0.1907	+35	-34
η Virginis	4.0	1.06	6.6	0 14.5	18 0.1	+ 2 41.6	-0.2206	0.5760	0.1906	+22	-48
γ Virginis (mean)	2.9	0.98	5.6	1 1.7	5 3 28.0	+11 49.2	-1.2309	0.5752	0.1889	+45	-90
38 Virginis	6.1	0.95	4.5	3 8.2	8 27.6	- 7 21.9	-0.0607	0.5749	0.1873	+31	-38
91 G. Virginis	6.5	+0.96	- 4.3	- 3 48.4	8 38.5	- 7 11.4	+0.5770	0.5749	-0.1872	+73	- 3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y'</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>								
<i>k</i> Virginis	5.7	+0.93	-4.2	- 3 23.9	5 11 15.9	- 4 39.6	-0.3220	0.5748	-0.1861	+16	-54
46 Virginis	6.1	0.92	4.3	2 57.4	11 40.5	- 4 15.8	-0.8416	0.5747	0.1860	-14	-90
48 Virginis	6.5	0.91	4.0	3 15.0	13 6.8	- 2 52.6	-0.8138	0.5747	0.1853	-12	-90
θ Virginis	4.4	0.90	3.2	5 7.8	15 44.0	0 21.0	+0.5869	0.5747	0.1841	+74	- 2
SATURN	0.8	...	...	5 26.6	20 58.3	+ 4 42.1	-0.0546	0.5752	0.1815	+31	-38
65 Virginis	6.0	+0.83	-2.9	- 4 31.4	21 32.8	+ 5 15.4	-1.0830	0.5746	-0.1807	-31	-90
66 Virginis	5.7	0.83	2.8	4 45.8	22 4.7	+ 5 46.1	-0.9380	0.5746	0.1804	-21	-90
72 Virginis	6.1	0.82	2.1	6 4.4	6 0 37.8	+ 8 13.9	-0.0786	0.5746	0.1788	+29	-39
<i>l</i> Virginis	4.8	0.80	2.1	5 51.6	1 18.3	+ 8 52.9	-0.4149	0.5746	0.1783	+11	-61
<i>m</i> Virginis	5.2	0.78	0.9	8 18.9	5 29.0	-11 5.4	+1.3184	0.5747	0.1753	+79	+62
88 Virginis	6.5	+0.73	-1.3	- 6 27.2	8 23.7	- 8 16.8	-1.0631	0.5748	-0.1730	-31	-90
598 B. Virginis	6.1	0.71	-0.6	7 40.8	11 17.2	- 5 29.3	-0.3241	0.5749	0.1705	+15	-54
623 B. Virginis	6.5	0.68	+0.2	8 53.3	15 20.8	- 1 34.6	+0.2093	0.5751	0.1669	+44	-23
95 Virginis	5.4	0.67	0.3	8 56.8	16 22.2	0 35.3	+0.0979	0.5752	0.1659	+37	-29
96 Virginis	6.5	0.67	0.7	9 58.2	17 21.2	+ 0 21.6	+0.9696	0.5752	0.1650	+81	+22
κ Virginis	4.3	+0.65	+0.9	- 9 54.9	19 2.1	+ 1 58.8	+0.6387	0.5753	-0.1634	+75	+ 1
4 G. Libræ	6.5	0.60	1.8	11 19.2	7 0 7.6	+ 6 53.3	+1.2426	0.5757	0.1581	+79	+48
6 B. Libræ	6.2	0.53	2.5	11 58.7	5 28.3	-11 57.4	+1.0818	0.5761	0.1521	+79	+31
22 B. Libræ	6.4	0.48	3.0	12 30.9	10 8.5	- 7 27.2	+0.9319	0.5765	0.1466	+78	+20
13 Libræ	5.7	0.44	2.9	11 35.1	12 56.3	+ 4 45.5	-0.4197	0.5768	0.1431	+ 6	-61
ξ^2 Libræ	5.6	+0.42	+2.8	-11 5.9	13 58.1	- 3 45.9	-1.0601	0.5769	-0.1418	-34	-90
γ Libræ	4.0	0.24	5.2	14 31.9	8 6 34.1	-11 45.7	+0.2730	0.5785	0.1187	+43	-19
190 B. Libræ	6.5	0.19	5.4	14 47.8	9 56.6	- 8 30.6	+0.1513	0.5788	0.1136	+35	-26
η Libræ	5.5	0.19	5.7	15 25.6	10 13.1	- 8 14.6	+0.7668	0.5788	0.1132	+75	+ 9
195 B. Libræ	6.2	0.14	5.3	13 54.0	13 28.2	- 5 6.6	-1.1584	0.5791	0.1081	-47	-90
202 B. Libræ	6.4	+0.11	+5.5	-14 10.4	15 25.7	- 3 13.4	-1.0888	0.5793	-0.1050	-41	-90
203 B. Libræ	6.2	0.12	5.7	14 36.2	15 33.5	- 3 5.8	-0.6603	0.5793	0.1048	-11	-86
49 Libræ	5.4	+0.10	6.3	16 18.3	17 10.5	- 1 32.4	+0.9208	0.5794	0.1023	+74	+20
ϕ Ophiuchi	4.4	-0.07	6.9	16 26.6	9 6 17.2	+11 5.7	-0.1343	0.5802	0.0804	+16	-43
24 Scorpii	5.0	0.13	7.4	17 35.5	10 42.8	- 8 38.3	+0.7136	0.5804	0.0727	+72	+ 6
78 B. Ophiuchi	6.5	-0.21	+7.2	-16 41.0	16 52.8	- 2 41.8	-0.6427	0.5805	-0.0618	-14	-84
90 B. Ophiuchi	6.5	0.23	7.7	18 7.7	18 26.5	- 1 11.5	+0.7609	0.5805	0.0590	+72	+10
125 B. Ophiuchi	6.2	0.28	7.6	17 30.4	22 4.5	+ 2 18.5	-0.0864	0.5804	0.0525	+16	-40
164 B. Ophiuchi	6.0	0.34	7.7	17 40.5	10 3 2.2	+ 7 5.5	-0.1496	0.5803	0.0435	+11	-44
192 B. Ophiuchi	6.3	0.36	7.9	18 22.4	5 2.6	+ 9 1.5	+0.4938	0.5802	0.0398	+51	- 7
305 B. Ophiuchi	6.3	-0.53	+7.8	-18 47.2	18 25.7	- 2 4.5	+0.5610	0.5790	-0.0151	+54	- 2
6 Sagittarii	6.5	0.55	7.3	17 9.2	20 48.0	+ 0 12.7	-1.1812	0.5787	0.0108	-59	-90
32 G. Sagittarii	5.7	0.58	7.3	17 9.9	23 34.0	+ 2 52.8	-1.1932	0.5783	-0.0057	-61	-90
64 B. Sagittarii	6.1	0.62	7.6	18 41.0	21 51.5	+ 6 3.1	+0.3921	0.5778	+0.0004	+39	-12
6 B. Scuti	5.9	0.63	7.2	17 24.0	3 36.2	+ 6 46.2	-0.9563	0.5776	0.0017	-40	-90
52 G. Sagittarii	6.4	-0.63	+7.5	-18 29.4	3 42.6	+ 6 52.3	+0.1896	0.5776	+0.0019	+27	-24
17 H ¹ Sagittarii	6.4	0.64	7.6	18 38.9	4 14.6	+ 7 23.2	+0.3569	0.5775	0.0029	+37	-14
<i>Y</i> Sagittarii (<i>var.</i>)	5.4	0.65	7.6	18 53.6	5 23.4	+ 8 29.6	+0.6190	0.5773	0.0050	+59	+ 1
85 B. Sagittarii	6.0	0.68	7.2	17 50.8	8 14.5	+11 14.6	-0.4601	0.5768	0.0102	- 9	-65
95 B. Sagittarii	5.7	0.69	7.4	18 46.6	9 12.3	-11 49.8	+0.5295	0.5766	0.0119	+51	- 4
100 B. Sagittarii	5.0	-0.70	+7.3	-18 27.3	9 44.9	-11 18.3	+0.1975	0.5765	+0.0129	+28	-23
187 B. Sagittarii	6.4	0.85	6.7	18 51.4	1 20.0	+ 3 43.6	+1.0437	0.5726	0.0406	+72	+30
ρ Sagittarii	4.0	0.90	6.1	17 59.5	7 45.9	+ 9 56.0	+0.4257	0.5709	0.0515	+47	-11
45 Sagittarii	6.0	0.90	6.2	18 27.0	7 49.8	+ 9 59.9	+0.9158	0.5707	0.0517	+72	+20
267 B. Sagittarii	5.8	0.95	5.7	18 24.1	14 36.4	- 7 27.8	+1.2549	0.5685	0.0629	+72	+57
54 Sagittarii	5.4	-0.94	+5.2	-16 28.2	16 16.4	- 5 51.3	-0.6936	0.5679	+0.0656	-17	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
<i>e</i> Sagittarii	5.2	-0.95	+ 5.2	-16 18.3	12 17 4.8	- 5 4.5	-0.8163	0.5676	+0.0669	-24	-90
<i>g</i> Sagittarii	5.1	0.99	+ 4.6	15 41.7	13 0 2.7	+ 1 39.1	-0.9636	0.5651	0.0778	-33	-90
NEW MOON.											
342 B. Aquarii	6.5	-0.88	- 4.2	- 4 30.6	17 8 32.2	+ 6 51.9	+1.0440	0.5260	+0.1703	+86	+27
20 Piscium	5.6	-0.82	- 4.7	- 3 11.5	17 9.3	- 8 46.1	+1.0669	0.5241	+0.1718	+87	+29
80 B. Piscium	6.3	0.75	5.1	- 0 55.9	18 2 11.5	+ 0 0.5	+0.1282	0.5226	0.1724	+42	-27
98 B. Piscium	6.3	0.69	5.2	+ 1 15.6	8 55.7	+ 6 33.1	-1.1345	0.5217	0.1722	-35	-89
44 Piscium	6.0	0.66	5.4	1 30.7	12 58.2	+10 28.6	-0.7191	0.5213	0.1719	- 5	-89
155 B. Piscium	6.5	0.56	6.1	2 57.9	19 2 43.6	- 0 9.7	+0.0198	0.5206	0.1694	+36	-33
73 Piscium	6.2	-0.48	- 6.0	+ 5 14.5	9 55.7	+ 6 50.0	-1.2922	0.5206	+0.1673	-54	-85
77 Piscium	6.4	0.49	6.2	4 29.8	10 25.9	+ 7 19.4	-0.3814	0.5206	0.1671	+14	-58
<i>e</i> Piscium	5.6	0.47	6.1	5 14.5	11 47.7	+ 8 38.8	-0.9793	0.5207	0.1667	-22	-85
μ Piscium	5.0	0.37	6.8	5 44.8	23 19.5	- 4 9.2	+0.3568	0.5215	0.1620	+56	-14
64 Ceti	5.8	0.17	7.5	8 12.5	20 20 56.1	- 7 10.2	+0.9990	0.5250	0.1495	+90	+27
ξ^1 Ceti	4.5	-0.16	- 7.4	+ 8 29.0	21 47.1	- 6 20.6	+0.8200	0.5251	+0.1488	+90	+15
ξ Arietis	5.5	0.09	7.2	10 15.6	21 3 53.6	- 0 25.0	-0.2515	0.5266	0.1444	+21	-46
25 Arietis	6.5	0.09	7.5	9 51.3	5 14.4	+ 0 53.5	+0.3908	0.5270	0.1433	+59	-10
389 B. Ceti	6.3	0.08	7.8	9 13.2	6 22.1	+ 1 59.1	+1.2541	0.5272	0.1425	+90	+53
85 Ceti	6.3	-0.01	7.8	10 24.7	12 58.8	+ 8 24.1	+0.8592	0.5291	0.1370	+90	+19
38 Arietis	5.2	+0.02	- 7.3	+12 7.2	14 13.3	+ 9 36.3	-0.8588	0.5295	+0.1359	-15	-78
147 B. Arietis	5.8	0.13	7.7	12 53.3	22 1 5.7	- 3 50.8	-0.2809	0.5331	0.1259	+19	-45
30 B. Tauri	6.4	0.30	7.8	15 10.6	16 42.4	+11 17.1	-0.9547	0.5391	0.1092	-22	-75
179 B. Tauri	5.9	0.44	8.8	14 57.3	23 7 15.5	+ 1 22.8	+0.7514	0.5453	0.0915	+90	+17
48 Tauri	6.3	0.48	8.9	15 12.4	11 7.5	+ 5 7.3	+0.8201	0.5471	0.0864	+90	+22
γ Tauri	3.9	+0.50	- 8.9	+15 26.4	13 2.4	+ 6 58.6	+0.7282	0.5480	+0.0838	+90	+17
δ Tauri	3.9	0.53	8.3	17 21.6	14 30.6	+ 8 23.9	-1.2384	0.5487	0.0818	-52	-73
63 Tauri	5.7	0.53	8.6	16 35.8	14 45.0	+ 8 37.8	-0.3876	0.5487	0.0815	+13	-47
64 Tauri	4.9	0.54	8.4	17 15.9	15 3.8	+ 8 56.0	-1.0883	0.5489	0.0811	-34	-73
70 Tauri	6.4	0.54	9.0	15 45.8	15 48.4	+ 9 39.2	+0.6026	0.5492	0.0801	+79	+10
71 Tauri	4.6	+0.54	- 9.1	+15 26.5	16 9.3	+ 9 59.4	+0.9795	0.5494	+0.0796	+90	+34
75 Tauri	5.2	0.55	8.9	16 11.2	17 8.4	+10 56.6	+0.2490	0.5499	0.0782	+50	-10
θ^1 Tauri	4.2	0.55	9.0	15 47.4	17 12.3	+11 0.3	+0.6842	0.5499	0.0781	+90	+15
θ^2 Tauri	3.6	0.55	9.0	15 41.9	17 14.9	+11 2.8	+0.7865	0.5499	0.0781	+90	+21
80 Tauri	5.8	0.55	9.2	15 28.1	17 57.1	+11 43.6	+1.0908	0.5502	0.0771	+90	+43
264 B. Tauri	4.8	+0.56	- 9.0	+16 1.5	18 8.5	+11 54.7	+0.5012	0.5503	+0.0768	+69	+ 4
81 Tauri	5.5	0.56	9.2	15 31.4	18 11.4	+11 57.5	+1.0499	0.5504	0.0767	+90	+40
85 Tauri	6.0	0.56	9.2	15 41.1	18 45.7	+11 29.3	+0.9173	0.5506	0.0759	+90	+30
275 B. Tauri	6.5	0.58	9.0	16 9.6	19 35.6	-10 41.0	+0.4642	0.5510	0.0748	+66	+ 3
α Tauri (<i>Aldebar.</i>)	1.1	0.59	9.0	16 21.2	20 39.9	- 9 38.8	+0.3342	0.5515	0.0732	+56	- 4
89 Tauri	5.8	+0.60	- 9.2	+15 52.7	21 43.4	- 8 37.5	+0.9259	0.5520	+0.0717	+90	+31
σ^1 Tauri	5.2	0.60	9.4	15 38.8	22 11.7	- 8 10.1	+1.2092	0.5522	0.0710	+90	+57
σ^2 Tauri	4.9	0.60	9.3	15 45.8	22 14.9	- 8 6.9	+1.0863	0.5522	0.0709	+90	+44
318 B. Tauri	5.7	0.69	9.3	17 1.9	24 6 39.9	+ 0 1.5	+0.2585	0.5562	0.0585	+50	- 7
<i>m</i> Tauri	5.0	0.76	9.0	18 32.4	11 15.9	+ 4 28.3	-1.1133	0.5584	0.0514	-37	-72
111 Tauri	5.1	+0.82	- 9.9	+17 18.6	19 2.4	+11 59.0	+0.5597	0.5620	+0.0390	+74	+12
115 Tauri	5.3	0.84	9.8	17 53.7	20 17.1	-10 48.9	-0.0188	0.5626	0.0369	+33	-20
117 Tauri	6.0	0.84	10.0	17 10.4	20 41.0	-10 25.8	+0.7678	0.5628	0.0362	+90	+24
119 Tauri	4.9	0.86	9.7	18 32.1	22 33.2	- 8 37.4	-0.6244	0.5636	0.0331	- 1	-61
167 H ¹ Tauri	5.5	0.85	10.2	17 0.0	22 35.3	- 8 35.4	+1.0190	0.5637	0.0331	+90	+42
120 Tauri	5.6	+0.87	- 9.7	+18 29.0	23 8.8	- 8 3.0	-0.5497	0.5639	+0.0322	+ 3	-54

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.			
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>°</i>	<i>d</i>	<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>		<i>°</i>		
122 Tauri	5.5	+0.88	-10.3	+16 59.5	25	0	45.5	-6 29.7	+1.0942	0.5646	+0.0295	+90	+49
130 Tauri	5.6	0.92	10.3	17 41.9		5	23.7	-2 1.1	+0.4563	0.5667	0.0216	+65	+ 8
19 B. Geminorum	6.2	1.04	10.6	18 41.9		16	56.3	+ 9 7.4	-0.4704	0.5717	0.0015	+ 8	-45
124 H. Orionis	5.7	1.04	10.8	17 55.6		17	21.2	+ 9 31.3	+0.3464	0.5719	0.0007	+57	+ 4
71 Orionis	5.1	1.04	10.5	19 10.9		17	30.2	+ 9 40.1	-0.9791	0.5719	+0.0005	-25	-71
B. D. +17°1191						18	12.4	+10 20.8	+1.1077	0.5722	-0.0008	+90	+52
287 B. Orionis	6.2	1.05	11.1	17 21.2		19	21.4	+11 27.3	+0.9481	0.5727	0.0028	+90	+39
292 B. Orionis	6.5	1.07	11.0	17 47.9		20	24.0	-11 32.3	+0.4751	0.5731	0.0047	+67	+10
26 Geminorum	5.2	1.14	11.4	17 43.1	26	5	30.9	-2 44.9	+0.4375	0.5766	0.0212	+64	+ 7
74 B. Geminorum	6.2	1.17	11.4	18 16.5		7	39.5	-0 40.9	-0.1950	0.5773	0.0252	+23	-29
110 B. Geminorum	6.2	+1.22	-11.7	+17 51.8		14	7.3	+ 5 32.8	+0.0349	0.5795	-0.0370	+36	-17
41 H. Geminorum	6.0	1.21	12.1	16 47.0		14	11.5	+ 5 36.9	+1.1572	0.5795	0.0372	+90	+54
λ Geminorum	3.6	1.26	12.3	16 40.6		20	49.6	-11 59.5	+0.9756	0.5815	0.0494	+90	+37
162 B. Geminorum	5.7	1.31	12.4	17 14.9	27	2	38.1	-6 23.7	+0.0644	0.5831	0.0601	+38	-18
γ Geminorum	5.3	1.33	12.3	17 50.9		5	52.3	-3 16.6	-0.7580	0.5839	0.0660	- 9	-73
1 Cancri	6.0	+1.38	-12.9	+15 59.6		13	16.5	+ 3 51.3	+0.6111	0.5855	-0.0794	+80	+11
2 B. Cancri	6.0	1.38	12.8	16 43.4		13	54.6	+ 4 27.9	-0.1889	0.5856	0.0805	+24	-34
3 Cancri	5.7	1.39	12.6	17 31.0		14	51.1	+ 5 22.3	-1.0786	0.5858	0.0822	-33	-73
5 Cancri	5.9	1.39	12.8	16 39.9		15	9.7	+ 5 40.3	-0.2310	0.5859	0.0828	+21	-37
30 B. Cancri	6.1	1.41	13.3	14 51.3		19	9.5	+ 9 31.1	+1.2756	0.5865	0.0899	+82	+67
29 Cancri	5.9	+1.45	-13.5	+14 27.8	28	2	32.5	-7 22.4	+0.9587	0.5876	-0.1026	+90	+31
90 B. Cancri	6.3	1.47	13.3	15 34.6		5	39.8	-4 22.0	-0.5028	0.5880	0.1079	+ 6	-57
54 Cancri	6.3	1.49	13.3	15 38.0		11	52.7	+ 1 37.0	-1.2594	0.5886	0.1181	-55	-75
222 B. Cancri	6.3	+1.54	-13.9	+11 49.2		23	5.0	-11 35.8	+1.1628	0.5892	-0.1354	+90	+45

MARCH.

ξ Leonis	5.1	+1.56	-13.8	+11 38.3	1	4	56.7	-5 57.3	+0.5249	0.5893	-0.1437	+70	0
18 Leonis	5.8	1.57	13.6	12 9.7		10	56.8	-0 10.6	-0.8860	0.5894	0.1518	-17	-78
19 Leonis	6.4	1.57	13.6	11 55.3		11	23.0	+0 14.7	-0.7122	0.5893	0.1523	- 6	-78
<i>R</i> Leonis (<i>var.</i>)	4.6	+1.57	-13.7	+11 47.0		11	26.1	+0 17.7	-0.5820	0.5893	-0.1524	+ 2	-68
<i>A</i> Leonis	4.6	1.59	13.6	10 22.3		19	55.0	+ 8 27.6	-0.5105	0.5892	0.1627	+ 6	-64
44 Leonis	5.9	1.60	13.4	9 10.4	2	3	8.9	-8 34.8	-0.5228	0.5889	0.1703	+ 6	-66
48 Leonis	5.2	1.61	13.3	7 20.8		7	8.5	-4 44.1	+0.5999	0.5887	0.1741	+76	+ 1
49 Leonis	5.7	1.60	13.2	9 2.7		7	13.8	-4 39.0	-1.0980	0.5887	0.1742	-32	-81
37 Sextantis	6.3	+1.61	-13.1	+ 6 46.5		11	51.1	-0 12.0	+0.3346	0.5885	-0.1782	+55	-14
56 Leonis	6.1	1.61	12.8	6 35.6		16	0.0	+ 3 47.5	-0.2308	0.5883	0.1813	+22	-47
<i>c</i> Leonis	5.1	1.61	12.7	6 30.7		17	58.4	+ 5 41.6	-0.5099	0.5882	0.1828	+ 6	-66
80 Leonis	6.4	1.61	12.0	4 16.8	3	4	28.3	-8 11.9	-0.2605	0.5876	0.1888	+20	-49
83 Leonis	6.3	1.60	11.9	3 25.8		4	52.9	-7 48.2	+0.5007	0.5875	0.1890	+67	- 6
τ Leonis	5.2	+1.61	-11.9	+ 3 16.6		5	21.0	-7 21.1	+0.5625	0.5875	-0.1891	+73	- 3
89 Leonis	5.7	1.60	11.8	3 29.1		8	2.9	-4 45.3	-0.1540	0.5873	0.1902	+26	-43
β Virginis	3.8	1.61	11.2	2 11.7		14	51.5	+ 1 48.2	-0.1875	0.5870	0.1923	+24	-45
27 B. Virginis	6.5	1.60	10.7	+0 57.4		18	23.6	+ 5 12.4	+0.3520	0.5869	0.1930	+56	-15
13 Virginis	5.9	1.58	9.9	-0 21.7	4	2	36.9	-10 52.5	+0.0603	0.5865	0.1933	+38	-31
η Virginis	4.0	+1.58	- 9.8	-0 14.5		3	8.2	-10 22.5	-0.1588	0.5865	-0.1932	+26	-44
γ Virginis (<i>mean</i>)	2.9	1.53	8.9	1 1.8		12	16.8	-1 34.0	-1.1454	0.5862	0.1918	-36	-90
38 Virginis	6.1	1.53	8.0	3 8.2		17	6.0	+ 3 4.5	+0.0096	0.5860	0.1902	+35	-34
91 G. Virginis	6.5	1.54	7.9	3 48.5		17	16.6	+ 3 14.6	+0.6372	0.5861	0.1900	+79	+ 1
<i>k</i> Virginis	5.7	1.52	7.7	3 23.9		19	48.4	+ 5 40.9	-0.2455	0.5861	0.1892	+21	-49
46 Virginis	6.1	+1.51	- 7.8	-2 57.4		20	12.1	+ 6 3.6	-0.7562	0.5861	-0.1889	- 8	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
48 Virginis	6.5	+1.51	-7.6	3 15.1	4 21 35.4	+ 7 23.8	-0.7279	0.5861	-0.1883	- 7	-90
θ Virginis	4.4	1.51	7.0	5 7.8	5 0 7.0	+ 9 49.8	+0.6513	0.5860	0.1870	+80	+ 2
SATURN	0.7	...	...	4 58.6	3 42.8	-10 42.4	-0.1697	0.5882	0.1860	+24	-44
65 Virginis	6.0	1.47	6.5	4 31.4	5 43.4	- 8 46.3	-0.9874	0.5860	0.1838	-24	-90
66 Virginis	5.7	1.47	6.4	4 45.8	6 14.2	- 8 16.6	-0.8445	0.5860	0.1834	-14	-90
72 Virginis	6.1	+1.47	-5.9	6 4.5	8 41.8	- 5 54.4	+0.0018	0.5860	-0.1818	+33	-34
l Virginis	4.8	1.46	5.9	5 51.6	9 20.8	- 5 16.9	-0.3285	0.5860	0.1813	+15	-54
88 Virginis	6.5	1.41	5.0	6 27.3	16 11.1	+ 1 18.3	-0.9626	0.5861	0.1759	-23	-90
598 B. Virginis	6.1	1.40	4.4	7 40.9	18 58.5	+ 3 59.4	-0.2347	0.5861	0.1734	+20	-48
623 B. Virginis	6.5	1.39	3.6	8 53.3	22 53.5	+ 7 45.8	+0.2914	0.5862	0.1697	+49	-18
95 Virginis	5.4	+1.38	-3.5	8 56.9	23 52.8	+ 8 42.8	+0.1823	0.5862	-0.1688	+43	-24
96 Virginis	6.5	1.38	3.2	9 58.3	6 0 49.7	+ 9 37.7	+1.0401	0.5862	0.1678	+81	+27
κ Virginis	4.3	1.37	3.0	9 55.0	2 27.2	+11 11.6	+0.7152	0.5862	0.1661	+81	+ 6
4 G. Libræ	6.5	1.34	2.1	11 19.3	7 22.4	- 8 4.2	+1.3111	0.5863	0.1607	+77	+63
6 B. Libræ	6.2	1.28	1.3	11 58.7	12 32.5	- 3 5.5	+1.1546	0.5863	0.1546	+79	+38
22 B. Libræ	6.4	+1.25	-0.7	-12 31.0	17 3.7	+ 1 15.6	+1.0083	0.5864	-0.1489	+78	+26
13 Libræ	5.7	1.21	0.7	11 35.1	19 46.3	+ 3 52.1	-0.3224	0.5864	0.1453	+12	-54
ξ ² Libræ	5.6	1.20	0.7	11 6.0	20 46.2	+ 4 49.8	-0.9530	0.5864	0.1440	-26	-90
17 Libræ	6.4	1.18	-0.7	10 50.8	21 22.8	+ 5 25.0	-1.2950	0.5864	0.1431	-64	-83
γ Libræ	4.0	1.05	+2.0	14 32.0	7 12 54.0	- 3 38.4	+0.3618	0.5863	0.1203	+49	-14
190 B. Libræ	6.5	+1.01	+2.3	-14 47.8	16 11.4	- 0 28.3	+0.2416	0.5862	-0.1151	+41	-21
η Libræ	5.5	1.01	2.5	15 25.7	16 27.5	- 0 12.9	+0.8494	0.5862	0.1147	+75	+15
195 B. Libræ	6.2	0.96	2.3	13 54.1	19 37.9	+ 2 50.4	-1.0524	0.5861	0.1095	-37	-90
202 B. Libræ	6.4	0.94	2.6	14 10.4	21 32.8	+ 4 41.1	-0.9840	0.5860	0.1064	-32	-90
203 B. Libræ	6.2	0.94	2.7	14 36.2	21 40.3	+ 4 48.4	-0.5607	0.5860	0.1061	- 5	-74
48 Libræ	4.6	+0.93	+2.6	-14 3.5	22 21.8	+ 5 28.3	-1.1884	0.5860	-0.1050	-51	90
49 Libræ	5.4	0.93	3.4	16 18.4	23 15.1	+ 6 19.6	+1.0020	0.5859	0.1035	+74	+26
φ Ophiuchi	4.4	0.77	4.5	16 26.7	8 12 6.3	- 5 17.7	-0.0430	0.5850	0.0813	+21	-37
24 Scorpïi	5.0	0.72	5.2	17 35.6	16 27.6	- 1 6.1	+0.7964	0.5846	0.0735	+73	+12
78 B. Ophiuchi	6.5	0.63	5.2	16 41.0	22 32.2	+ 4 45.0	-0.5500	0.5838	0.0625	- 9	-73
90 B. Ophiuchi	6.5	+0.61	+5.8	-18 7.7	9 0 4.8	+ 6 14.1	+0.8424	0.5836	-0.0596	+72	+15
125 B. Ophiuchi	6.2	0.56	5.8	17 30.4	3 40.2	+ 9 41.6	+0.0005	0.5831	0.0530	+20	-34
164 B. Ophiuchi	6.0	0.49	6.1	17 40.5	8 34.9	- 9 34.5	-0.0638	0.5823	0.0439	+16	-38
192 B. Ophiuchi	6.3	0.47	6.4	18 22.4	10 34.3	- 7 39.5	+0.5751	0.5819	0.0403	+57	- 2
305 B. Ophiuchi	6.3	0.28	7.0	18 47.3	23 52.7	+ 5 9.8	+0.6384	0.5790	0.0155	+61	+ 2
6 Sagittarii	6.5	+0.24	+6.4	-17 9.2	10 2 14.6	+ 7 26.7	-1.0986	0.5784	-0.0112	- 50	-90
32 G. Sagittarii	5.7	0.21	6.5	17 9.9	5 0.2	+10 6.3	-1.1120	0.5777	0.0061	-52	-90
64 B. Sagittarii	6.1	0.16	7.0	18 41.1	8 17.5	-10 43.5	+0.4673	0.5768	-0.0001	+45	- 8
6 B. Scuti	5.9	0.15	6.6	17 24.0	9 2.2	-10 0.4	-0.8781	0.5766	+0.0013	-35	-90
52 G. Sagittarii	6.4	0.15	7.0	18 29.4	9 8.6	- 9 54.3	+0.2650	0.5766	0.0015	+31	-19
17 H ¹ . Sagittarii	6.4	+0.14	+7.0	-18 38.9	9 40.6	- 9 23.4	+0.4317	0.5764	+0.0025	+43	-10
Y ¹ Sagittarii (var.)	5.4	0.13	7.2	18 53.6	10 49.4	- 8 17.1	+0.6929	0.5761	0.0045	+67	+ 6
85 B. Sagittarii	6.0	0.09	6.8	17 50.8	13 40.7	- 5 31.9	-0.3854	0.5753	0.0097	- 5	-59
95 B. Sagittarii	5.7	0.08	7.2	18 46.6	14 38.6	- 4 36.1	+0.6021	0.5749	0.0115	+57	0
100 B. Sagittarii	5.0	+0.07	7.0	18 27.3	15 11.2	- 4 4.6	+0.2705	0.5748	0.0125	+33	-19
187 B. Sagittarii	6.4	-0.13	+6.9	-18 51.4	11 6 50.0	+11 1.0	+1.1102	0.5696	+0.0399	+72	+37
ρ Sagittarii	4.0	0.21	6.5	17 59.5	13 18.6	- 6 43.9	+0.4890	0.5673	0.0507	+51	- 7
45 Sagittarii	6.0	0.21	6.7	18 27.0	13 22.6	- 6 40.1	+0.9797	0.5673	0.0508	+72	+25
54 Sagittarii	5.4	0.30	5.8	16 28.2	21 53.4	+ 1 33.2	-0.6365	0.5640	0.0646	-14	-83
e Sagittarii	5.2	0.31	5.7	16 18.2	22 42.3	+ 2 20.4	-0.7599	0.5637	0.0658	-21	-90
g Sagittarii	5.1	-0.39	+5.2	-15 41.7	12 5 44.4	+ 9 8.1	-0.9116	0.5609	+0.0766	-30	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	'	d h m	h m				'	'
16 B. Capricorni	6.2	-0.49	+ 4.6	-15 1.6	12 16 16.7	- 4 40.6	-0.7429	0.5566	+0.0918	-17	-00
β Capricorni	3.2	0.48	4.6	15 1.5	16 23.2	- 4 34.3	-0.7360	0.5566	0.0920	-17	-00
31 B. Capricorni	6.4	0.53	4.6	15 59.8	19 58.6	- 1 6.1	+0.6478	0.5551	0.0969	+69	+ 2
27 G. Capricorni	6.2	0.53	4.4	15 18.8	21 5.1	- 0 1.7	+0.0218	0.5546	0.0984	+27	-33
45 B. Capricorni	6.1	0.53	4.0	13 59.2	22 33.7	+ 1 23.9	-1.2620	0.5540	0.1003	-62	-87
τ Capricorni	5.2	-0.56	+ 4.1	-15 13.5	13 0 56.4	+ 3 42.0	+0.3151	0.5530	+0.1034	+45	-17
95 B. Capricorni	5.9	0.64	3.4	14 46.8	10 10.5	-11 21.8	+0.8458	0.5493	0.1148	+76	+14
53 B. Aquarii	6.5	0.68	2.6	13 31.3	18 30.9	- 3 17.5	+0.4812	0.5460	0.1243	+58	- 8
18 Aquarii	5.5	0.71	2.2	13 12.5	22 30.0	+ 0 34.1	+0.6462	0.5445	0.1285	+72	+ 2
72 B. Aquarii	6.5	0.71	1.9	11 54.1	14 0 29.2	+ 2 29.6	-0.5170	0.5437	0.1305	+ 1	-69
137 B. Capricorni	6.2	-0.73	+ 1.3	-10 55.4	6 0.8	+ 7 50.8	-0.8464	0.5416	+0.1359	-18	-90
λ Capricorni	5.5	0.76	1.2	11 43.3	9 29.9	+11 13.4	+0.5023	0.5403	0.1391	+62	- 7
96 B. Aquarii	6.5	0.76	+ 0.7	10 40.5	13 1.0	- 9 22.0	-0.1445	0.5390	0.1422	+22	-43
θ Aquarii	4.3	0.79	- 0.5	8 10.0	15 0 41.3	+ 1 56.9	-1.1731	0.5351	0.1514	-42	-90
150 B. Aquarii	6.0	0.80	0.4	- 9 25.5	0 42.5	+ 1 58.1	+0.2066	0.5351	0.1514	+44	-23
NEW MOON.											
μ Piscium	5.0	-0.60	- 7.6	+ 5 44.7	19 6 4.3	+ 4 23.2	+0.3450	0.5231	+0.1624	+56	-14
64 Ceti	5.8	0.49	8.5	8 12.5	20 3 40.3	+ 1 21.6	+0.9883	0.5262	0.1497	+90	+26
ξ^1 Ceti	4.5	0.48	8.4	8 29.0	4 31.4	+ 2 11.1	+0.8088	0.5264	0.1491	+90	+14
ξ Arietis	5.5	-0.44	- 8.4	+10 15.6	10 38.2	+ 8 7.2	-0.2657	0.5276	+0.1446	+20	-46
25 Arietis	6.5	0.44	8.6	9 51.3	11 59.2	+ 9 25.9	+0.3786	0.5279	0.1436	+58	-10
389 B. Ceti	6.3	0.43	8.8	9 13.2	13 6.9	+10 31.5	+1.2449	0.5282	0.1428	+90	+52
85 Ceti	6.3	0.38	8.9	10 24.7	19 44.4	- 7 2.7	+0.8493	0.5297	0.1372	+90	+18
38 Arietis	5.2	0.36	8.5	12 7.2	20 59.2	- 5 50.2	-0.8751	0.5300	0.1361	-16	-78
147 B. Arietis	5.8	-0.29	- 8.9	+12 53.3	21 7 54.1	+ 4 45.1	-0.2945	0.5329	+0.1259	+18	-46
30 B. Tauri	6.4	0.16	9.0	15 10.6	23 37.1	- 4 0.6	-0.9710	0.5377	0.1091	-23	-75
179 B. Tauri	5.9	-0.04	9.6	14 57.3	22 14 19.4	+10 14.4	+0.7485	0.5427	0.0912	+90	+17
48 Tauri	6.3	0.00	9.7	15 12.4	18 14.4	- 9 58.1	+0.8187	0.5441	0.0861	+90	+22
γ Tauri	3.9	+0.02	9.7	15 26.4	20 11.0	- 8 5.2	+0.7266	0.5447	0.0835	+90	+17
δ Tauri	3.9	+0.03	- 9.2	+17 21.6	21 40.3	- 6 38.7	-1.2561	0.5453	+0.0815	-56	-73
63 Tauri	5.7	0.03	9.4	16 35.8	21 54.9	- 6 24.6	-0.3982	0.5454	0.0812	+12	-48
64 Tauri	4.9	0.04	9.2	17 15.9	22 14.0	- 6 6.1	-1.1048	0.5455	0.0808	-36	-73
70 Tauri	6.4	0.04	9.7	15 45.8	22 59.4	- 5 22.2	+0.6005	0.5458	0.0797	+78	+10
71 Tauri	4.6	0.04	9.8	15 26.5	23 20.5	- 5 1.8	+0.9806	0.5459	0.0792	+90	+34
75 Tauri	5.2	+0.05	- 9.6	+16 11.2	23 0 20.5	- 4 3.6	+0.2442	0.5463	+0.0779	+50	-10
θ^1 Tauri	4.2	0.05	9.8	15 47.4	0 24.5	- 3 59.8	+0.6831	0.5463	0.0778	+90	+15
θ^2 Tauri	3.6	0.06	9.8	15 41.9	0 27.1	- 3 57.3	+0.7863	0.5463	0.0777	+90	+21
80 Tauri	5.8	0.06	9.9	15 28.1	1 10.0	- 3 15.8	+1.0934	0.5466	0.0767	+90	+44
264 B. Tauri	4.8	0.07	9.7	16 1.5	1 21.6	- 3 4.6	+0.4986	0.5466	0.0764	+68	+ 4
81 Tauri	5.5	+0.06	- 9.9	+15 31.4	1 24.5	- 3 1.8	+1.0523	0.5467	+0.0764	+90	+40
85 Tauri	6.0	0.07	9.9	15 41.1	1 59.3	- 2 28.1	+0.9185	0.5469	0.0756	+90	+30
275 B. Tauri	6.5	0.08	9.7	16 9.6	2 50.0	- 1 38.9	+0.4617	0.5471	0.0744	+65	+ 2
α Tauri (Aldebar.)	1.1	0.09	9.8	16 21.2	3 55.4	- 0 35.7	+0.3309	0.5475	0.0729	+55	- 5
89 Tauri	5.8	0.10	9.9	15 52.6	4 59.8	+ 0 26.7	+0.9280	0.5479	0.0714	+90	+31
σ^1 Tauri	5.2	+0.10	-10.0	+15 38.8	5 28.6	+ 0 54.6	+1.2142	0.5481	+0.0707	+90	+57
σ^2 Tauri	4.9	0.10	10.0	15 45.8	5 32.0	+ 0 57.7	+1.0900	0.5481	0.0706	+90	+44
318 B. Tauri	5.7	0.18	9.9	17 1.9	14 6.0	+ 9 15.2	+0.2565	0.5513	0.0581	+50	- 7
m Tauri	5.0	0.24	9.5	18 32.4	18 47.4	-10 12.6	-1.1285	0.5530	0.0510	-39	-72
111 Tauri	5.1	0.31	10.2	17 18.6	24 2 43.8	- 2 31.9	+0.5636	0.5558	0.0387	+75	+12
λ 15 Tauri	5.3	+0.32	-10.0	+17 53.7	4 0.2	- 1 18.1	-0.0212	0.5563	+0.0367	+33	-20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, h	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	$''$								
117 Tauri	6.0	+0.32	-10.3	+17 10.4	24 4 24.7	- 0 54.5	+0.7745	0.5565	+0.0360	+90	+25
119 Tauri	4.9	0.34	9.9	18 32.1	6 19.5	+ 0 56.5	-0.6333	0.5571	0.0330	- 2	-62
167 Π^1 Tauri	5.5	0.34	10.4	16 59.9	6 21.6	+ 0 58.5	+1.0289	0.5571	0.0329	+90	+43
120 Tauri	5.6	0.35	9.9	18 29.0	6 55.9	+ 1 31.7	-0.5576	0.5574	0.0320	+ 3	-55
122 Tauri	5.5	0.36	10.5	16 59.5	8 34.8	+ 3 7.3	+1.1056	0.5579	0.0293	+90	+49
130 Tauri	5.6	+0.41	-10.4	+17 41.9	13 19.9	+ 7 42.8	+0.4613	0.5595	+0.0215	+66	+ 8
19 B. Geminorum	6.2	0.53	10.4	18 41.9	25 1 10.6	- 4 50.5	-0.4748	0.5635	0.0016	+ 7	-46
124 H^1 Orionis	5.7	0.53	10.7	17 55.6	1 36.3	+ 4 25.7	+0.3524	0.5637	0.0009	+57	+ 4
71 Orionis	5.1	0.54	10.3	19 10.9	1 45.4	- 4 16.9	-0.9900	0.5638	+0.0007	-28	-71
B. D. +17°1191	6.5	0.54	11.0	17 12.3	2 28.8	- 3 35.0	+1.1236	0.5640	-0.0006	+90	+54
287 B. Orionis	6.2	+0.55	-11.0	+17 21.2	3 39.8	- 2 26.5	+0.9623	0.5644	-0.0026	+90	+40
292 B. Orionis	6.5	0.56	10.8	17 47.9	4 44.1	- 1 24.3	+0.4833	0.5647	0.0045	+67	+11
26 Geminorum	5.2	0.66	11.1	17 43.1	14 6.6	+ 7 38.7	+0.4469	0.5676	0.0208	+64	+ 7
74 B. Geminorum	6.2	0.68	10.9	18 16.5	16 19.0	+ 9 46.5	-0.1936	0.5682	0.0246	+23	-29
110 B. Geminorum	6.2	0.75	11.2	17 51.8	22 58.4	- 7 48.0	+0.0402	0.5701	0.0363	+37	-17
41 H^1 Geminorum	6.0	+0.75	-11.6	+16 47.0	23 2.8	- 7 43.8	+1.1777	0.5701	-0.0364	+90	+56
λ Geminorum	3.6	0.82	11.7	16 40.6	26 5 52.9	- 1 8.2	+0.9945	0.5719	0.0484	+90	+38
162 B. Geminorum	5.7	0.88	11.6	17 14.9	11 52.1	+ 4 38.2	+0.0717	0.5734	0.0590	+39	-17
f Geminorum	5.3	0.91	11.5	17 50.9	15 12.3	+ 7 51.4	-0.7613	0.5741	0.0648	-10	-73
1 Cancri	6.0	0.98	12.2	15 59.6	22 49.9	- 8 47.4	+0.6267	0.5758	0.0780	+81	+12
2 B. Cancri	6.0	+0.99	-11.9	+16 43.4	23 29.2	- 8 9.5	-0.1838	0.5759	-0.0791	+24	-34
3 Cancri	5.7	1.00	11.7	17 31.0	27 0 27.4	- 7 13.3	-1.0850	0.5761	0.0808	-34	-73
5 Cancri	5.9	1.01	11.9	16 39.9	0 46.6	- 6 51.8	-0.2262	0.5761	0.0813	+22	-36
29 Cancri	5.9	1.11	12.6	14 27.8	12 29.3	+ 4 22.7	+0.9787	0.5783	0.1009	+90	+32
90 B. Cancri	6.3	1.14	12.3	15 34.6	15 41.9	+ 7 28.3	-0.5003	0.5789	0.1062	+ 6	-57
54 Cancri	6.3	+1.20	-12.3	+15 38.0	22 5.0	-10 22.6	1.2650	0.5798	-0.1163	-56	-75
222 B. Cancri	6.3	1.30	13.2	11 49.2	28 9 34.2	+ 0 41.5	+1.1826	0.5813	0.1337	+90	+47
ξ Leonis	5.1	1.35	13.1	11 38.3	15 33.8	+ 6 28.1	+0.5378	0.5820	0.1421	+71	0
18 Leonis	5.8	1.40	12.9	12 9.7	21 41.3	-11 37.9	-0.8852	0.5827	0.1502	-17	-78
19 Leonis	6.4	1.40	12.9	11 55.3	22 8.0	-11 12.2	-0.7101	0.5827	0.1508	- 5	-78
R Leonis (<i>var.</i>)	4.6	+1.40	-13.0	+11 47.0	22 11.2	-11 9.1	-0.5789	0.5827	-0.1508	+ 2	-68
A Leonis	4.6	1.46	13.0	10 22.3	29 6 49.0	- 2 50.2	-0.5069	0.5836	0.1613	+ 7	-64
44 Leonis	5.9	1.52	13.0	9 10.4	14 9.1	+ 4 13.7	-0.5194	0.5844	0.1691	+ 6	-65
48 Leonis	5.2	1.55	13.2	7 20.8	18 11.5	+ 8 7.2	+0.6075	0.5848	0.1732	+77	+ 1
49 Leonis	5.7	1.54	12.9	9 2.7	18 16.9	+ 8 12.4	-1.0971	0.5848	0.1732	-32	-81
37 Sextantis	6.3	+1.58	-13.0	+ 6 46.5	22 56.9	-11 17.9	+0.3400	0.5853	-0.1774	+55	-14
56 Leonis	6.1	1.61	12.9	6 35.6	30 3 7.6	- 7 16.6	-0.2278	0.5857	0.1808	+22	-47
c Leonis	5.1	1.62	12.8	6 30.7	5 6.8	- 5 21.8	0.5077	0.5859	0.1823	+ 7	-66
80 Leonis	6.4	1.68	12.4	4 16.8	15 38.6	+ 4 46.7	-0.2598	0.5870	0.1889	+20	-49
83 Leonis	6.3	1.68	12.4	3 25.8	16 3.1	+ 5 10.2	+0.5008	0.5871	0.1891	+67	- 7
τ Leonis	5.2	+1.69	-12.5	+ 3 16.6	16 31.3	+ 5 37.4	+0.5624	0.5872	-0.1893	+73	- 3
89 Leonis	5.7	1.70	12.3	3 29.1	19 13.0	+ 8 13.1	-0.1542	0.5874	0.1905	+26	-43
β Virginis	3.8	1.75	11.9	2 11.7	31 2 0.2	- 9 14.9	-0.1892	0.5882	0.1930	+24	-45
27 B. Virginis	6.5	1.76	11.7	+ 0 57.3	5 31.0	+ 5 51.9	+0.3472	0.5887	0.1938	+56	-15
13 Virginis	5.9	1.79	11.0	- 0 21.7	13 40.0	+ 1 58.7	+0.0540	0.5897	0.1946	+38	-31
η Virginis	4.0	+1.79	-11.0	- 0 14.5	14 10.9	+ 2 28.5	-0.1641	0.5898	-0.1946	+25	-44
γ Virginis (<i>mean</i>)	2.9	+1.80	-10.1	- 1 1.8	23 12.2	+11 9.5	-1.1461	0.5910	-0.1937	-36	-90

APRIL.

38 Virginis	6.1	+1.83	-9.6	- 3 8.3	1 3 56.6	- 8 16.8	-0.0016	0.5916	-0.1924	+34	-35
-------------	-----	-------	------	---------	----------	----------	---------	--------	---------	-----	-----

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.		
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.	
		Δα	Δδ											
		s	"	°	d	h	m	h	m			°	°	
91 G. Virginis	6.5	+1.84	-9.6	3 48.5	1	4	7.0	8 6.7	+0.6204	0.5917	-0.1923	+77	0	
k Virginis	5.7	1.84	9.3	3 24.0				6 36.0	-0.2555	0.5920	0.1914	+20	-50	
46 Virginis	6.1	1.83	9.3	2 57.4				6 59.2	-0.5210	0.5920	0.1913	-9	-90	
48 Virginis	6.5	1.84	9.1	3 15.1				8 20.9	-0.7340	0.5923	0.1906	-7	-90	
θ Virginis	4.4	1.86	8.8	5 7.8				10 49.5	+0.6310	0.5926	0.1895	+78	0	
SATURN	0.5	...	...	4 12.9				11 31.6	-0.58.9	0.5957	-0.1905	+12	-59	
65 Virginis	6.0	+1.84	-8.2	4 31.5				16 18.4	+3 37.0	-0.9926	0.5933	0.1865	-25	-90
66 Virginis	5.7	1.85	8.1	4 45.9				16 48.4	+4 5.9	-0.8515	0.5934	0.1862	-15	-90
72 Virginis	6.1	1.86	7.8	6 4.5				19 12.5	+6 24.6	-0.0155	0.5938	0.1846	+33	-35
l Virginis	4.8	1.86	7.7	5 51.6				19 50.6	+7 1.2	-0.3422	0.5939	0.1841	+14	-55
88 Virginis	6.5	+1.85	-6.9	6 27.3	2	2	30.2	-10 34.5	-0.9706	0.5947	-0.1788	-24	-90	
598 B. Virginis	6.1	1.85	6.4	7 40.9				5 13.0	-0.757.8	-0.2530	0.5951	0.1765	+19	-49
623 B. Virginis	6.5	1.86	5.8	8 53.4				9 1.3	+4 18.3	+0.2645	0.5955	0.1729	+48	-20
95 Virginis	5.4	1.86	5.7	8 56.9				9 58.9	-3 23.0	+0.1565	0.5957	0.1719	+41	-26
96 Virginis	6.5	1.87	5.4	9 58.3				10 54.1	-2 29.8	+1.0019	0.5958	0.1709	+81	+24
κ Virginis	4.3	+1.86	-5.2	9 55.0				12 28.7	-0 58.9	+0.6808	0.5960	-0.1692	+79	+3
4 G. Libræ	6.5	1.86	4.4	11 19.3				17 14.7	+3 36.1	+1.2655	0.5965	0.1639	+79	+52
6 B. Libræ	6.2	1.83	3.6	11 58.8				22 14.8	+8 24.8	+1.1086	0.5969	0.1578	+79	+34
22 B. Libræ	6.4	1.83	3.0	12 31.0	3	2	37.0	-11 23.2	+0.9623	0.5973	0.1520	+78	+22	
13 Libræ	5.7	1.80	2.8	11 35.1				5 14.0	-8 52.1	-0.3485	0.5974	0.1485	+10	-56
ξ ² Libræ	5.6	+1.79	-2.8	-11 6.0				6 11.9	-7 56.5	-0.9695	0.5975	-0.1471	-27	-90
17 Libræ	6.4	1.78	2.7	10 50.8				6 47.2	-7 22.6	-1.3062	0.5975	0.1463	-68	-78
γ Libræ	4.0	1.72	-0.1	14 32.0				21 45.5	+7 1.1	+0.3179	0.5979	0.1231	+46	-17
190 B. Libræ	6.5	1.70	+0.4	14 47.8	4	0	55.7	+10 3.9	+0.1985	0.5978	0.1178	+38	-23	
η Libræ	5.5	1.70	0.6	15 25.7				1 11.3	+10 18.8	+0.7958	0.5978	0.1173	+75	+11
195 B. Libræ	6.2	+1.65	+0.6	-13 54.1				4 14.8	-10 44.8	-1.0748	0.5977	-0.1120	-39	-90
202 B. Libræ	6.4	1.64	0.8	14 10.4				6 5.4	-8 58.4	-1.0083	0.5976	0.1087	-34	-90
203 B. Libræ	6.2	1.64	1.0	14 36.3				6 12.8	-8 51.4	-0.5922	0.5975	0.1086	-7	-77
48 Libræ	4.6	1.63	0.9	14 3.5				6 52.7	-8 13.0	-1.2095	0.5975	0.1074	-54	-90
49 Libræ	5.4	1.64	1.5	16 18.4				7 44.1	-7 23.5	+0.9433	0.5975	0.1059	+74	+22
φ Ophiuchi	4.4	+1.52	+3.1	-16 26.7	20	7	6.4	+4 31.2	-0.0883	0.5961	-0.0831	+18	-40	
24 Scorpii	5.0	1.49	3.9	17 35.6	5	0	19.8	+8 33.8	+0.7357	0.5955	0.0752	+73	+8	
78 B. Ophiuchi	6.5	1.41	4.2	16 41.0				6 11.8	-9 47.7	-0.5904	0.5943	0.0639	-11	-77
90 B. Ophiuchi	6.5	1.40	4.7	18 7.7				7 41.2	-8 21.7	+0.7790	0.5939	0.0610	+72	+11
125 B. Ophiuchi	6.2	1.35	4.9	17 30.4				11 9.4	-5 1.5	-0.0502	0.5932	0.0542	+18	-37
164 B. Ophiuchi	6.0	+1.30	+5.4	-17 40.5				15 54.5	-0 27.2	-0.1148	0.5920	-0.0449	+13	-41
192 B. Ophiuchi	6.3	1.28	5.8	18 22.4				17 50.1	+1 24.0	+0.5137	0.5915	0.0411	+52	-5
305 B. Ophiuchi	6.3	1.10	6.8	18 47.3	6	6	44.5	-10 10.8	+0.5737	0.5873	0.0160	+55	-2	
6 Sagittarii	6.5	1.06	6.4	17 9.2				9 2.4	-7 58.0	-1.1396	0.5864	0.0115	-55	-90
32 G. Sagittarii	5.7	1.02	6.6	17 9.9				11 43.6	-5 23.0	-1.1539	0.5854	0.0063	-57	-90
64 B. Sagittarii	6.1	+0.99	+7.3	-18 41.1				14 55.7	-2 17.8	+0.4037	0.5841	-0.0002	+40	-12
6 B. Scuti	5.9	0.97	6.9	17 24.0				15 39.2	-1 35.9	-0.9243	0.5838	+0.0012	-38	-90
52 G. Sagittarii	6.4	0.98	7.2	18 29.4				15 45.4	-1 30.0	+0.2039	0.5838	0.0014	+27	-23
17 H. Sagittarii	6.4	0.97	7.3	18 38.9				16 16.6	+0 59.9	+0.3684	0.5836	0.0024	+38	-14
Y Sagittarii (var.)	5.4	0.96	7.5	18 53.6				17 23.7	+0 4.7	+0.6261	0.5831	0.0045	+59	+1
85 B. Sagittarii	6.0	+0.91	+7.2	-17 50.8	20	10	8.4	+2 45.5	-0.4389	0.5819	+0.0097	-8	-64	
95 B. Sagittarii	5.7	0.90	7.6	18 46.6				21 7.3	+3 40.1	+0.5361	0.5815	0.0115	+52	-4
100 B. Sagittarii	5.0	0.89	7.5	18 27.3				21 39.1	+4 10.8	+0.2085	0.5813	0.0124	+29	-23
187 B. Sagittarii	6.4	0.67	8.1	18 51.4	7	12	58.2	-5 3.4	+1.0383	0.5742	0.0401	+72	+30	
ρ Sagittarii	4.0	0.58	7.9	17 59.5				19 20.0	+1 4.9	+0.4236	0.5710	0.0511	+46	-11
45 Sagittarii	6.0	+0.58	+8.0	-18 27.0				19 24.0	+1 8.7	+0.9096	0.5710	+0.0512	+72	+20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y'	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
267 B. Sagittarii	5.8	+0.49	+8.0	-18 24.1	8 2 7.8	+7 38.4	+1.2445	0.5676	+0.0623	+72	+55
54 Sagittarii	5.4	0.47	7.4	16 28.1	3 47.3	+9 14.5	-0.6925	0.5667	0.0649	-17	-90
e Sagittarii	5.2	0.46	7.3	16 18.2	4 35.5	+10 1.1	-0.8151	0.5663	0.0662	-24	-90
g Sagittarii	5.1	0.37	7.0	15 41.7	11 32.6	-7 16.2	-0.9664	0.5627	0.0770	-34	-90
16 B. Capricorni	6.2	0.24	6.6	15 1.6	21 59.4	+2 49.4	-0.7992	0.5574	0.0921	-20	-90
β Capricorni	3.2	+0.23	+6.6	-15 1.4	22 5.9	+2 55.7	-0.7925	0.5573	+0.0923	-20	-90
31 B. Capricorni	6.4	0.19	6.9	15 59.7	9 1 39.8	+6 22.5	+0.5844	0.5555	0.0971	+63	-2
27 G. Capricorni	6.2	0.17	6.6	15 18.8	2 45.9	+7 26.4	-0.0382	0.5549	0.0986	+23	-37
τ Capricorni	5.2	0.13	6.5	15 13.4	6 36.0	+11 9.0	+0.2542	0.5530	0.1036	+41	-20
95 B. Capricorni	5.9	+0.02	6.0	14 46.8	15 48.4	+3 56.6	+0.7851	0.5484	0.1149	+76	+10
53 B. Aquarii	6.5	-0.06	+5.2	-13 31.2	10 0 8.2	+4 7.1	+0.4242	0.5445	+0.1243	+55	-11
18 Aquarii	5.5	0.10	4.9	13 12.5	4 7.4	+7 58.8	+0.5901	0.5427	0.1284	+68	-2
72 B. Aquarii	6.5	0.11	4.4	11 54.1	6 6.7	+9 54.3	-0.5702	0.5418	0.1304	-2	-74
137 B. Capricorni	6.2	0.15	3.8	10 55.4	11 39.0	-8 43.7	-0.8976	0.5395	0.1358	-22	-90
λ Capricorni	5.5	0.19	3.8	11 43.2	15 8.6	-5 20.6	+0.4506	0.5380	0.1390	+58	-10
96 B. Aquarii	6.5	-0.22	+3.3	-10 40.4	18 40.4	-1 55.2	-0.2123	0.5366	+0.1420	+19	-47
θ Aquarii	4.3	0.29	1.9	8 10.0	11 6 23.7	+9 26.6	-1.2179	0.5323	0.1511	-47	-90
150 B. Aquarii	6.0	0.31	2.2	9 25.4	6 25.0	+9 28.0	+0.1619	0.5323	0.1511	+41	-25
ρ Aquarii	5.3	0.31	1.8	8 12.5	8 6.7	+11 6.6	-0.9129	0.5318	0.1523	-21	-90
167 G. Aquarii	6.3	0.38	1.2	8 17.9	17 24.9	-3 51.8	+0.6298	0.5289	0.1581	+76	0
67 Aquarii	6.4	-0.39	+0.8	-7 22.0	19 56.2	-1 25.0	+0.0067	0.5282	+0.1595	+33	-34
78 Aquarii	6.3	0.43	+0.5	7 36.8	12 1 48.5	+4 16.9	+1.2266	0.5267	0.1625	+83	+45
252 B. Aquarii	5.8	0.41	-0.1	5 23.9	2 8.1	+4 36.0	-1.1611	0.5266	0.1627	-39	-90
197 G. Aquarii	6.3	0.41	0.2	5 13.3	3 14.0	+5 39.9	-1.1766	0.5263	0.1632	-41	-90
263 B. Aquarii	6.1	0.43	-0.3	5 7.5	5 26.6	+7 48.7	-0.9214	0.5258	0.1643	-20	-90
82 Aquarii	6.4	-0.45	0.0	-6 59.3	5 58.0	+8 19.2	+1.2174	0.5257	+0.1644	+84	+44
293 B. Aquarii	5.5	0.46	-1.1	3 55.0	12 47.9	-9 2.9	-1.0387	0.5243	0.1670	-28	-90
96 Aquarii	5.7	0.49	0.9	5 32.7	14 47.6	-7 6.6	+1.0947	0.5239	0.1678	+85	+31
316 B. Aquarii	6.5	0.47	1.2	4 20.3	15 14.9	-6 40.2	-0.1617	0.5239	0.1679	+25	-44
342 B. Aquarii	6.5	0.51	1.6	4 30.5	21 11.3	-0 54.0	+1.0289	0.5229	0.1696	+86	+26
20 Piscium	5.6	-0.54	-2.4	-3 11.4	13 5 53.2	+7 32.8	+1.0550	0.5218	+0.1714	+87	+28
80 B. Piscium	6.3	0.55	3.4	-0 55.9	14 59.4	-7 36.6	+0.1169	0.5211	0.1724	+41	-28
NEW MOON.											
30 B. Tauri	6.4	-0.42	-9.6	+15 10.6	18 5 40.0	+3 49.7	-0.8818	0.5393	+0.1104	-17	-75
179 B. Tauri	5.9	-0.36	-10.1	+14 57.3	20 21.8	-5 55.9	+0.8532	0.5438	+0.0922	+90	+24
193 B. Tauri	6.2	0.34	9.7	17 4.7	22 40.9	-3 41.2	-1.2752	0.5445	0.0892	-61	-73
48 Tauri	6.3	0.34	10.2	15 12.4	19 0 17.0	-2 8.1	+0.9268	0.5450	0.0871	+90	+29
γ Tauri	3.9	0.33	10.2	15 26.4	2 13.7	-0 15.1	+0.8358	0.5456	0.0844	+90	+23
δ Tauri	3.9	0.31	9.8	17 21.6	3 43.1	+1 11.5	-1.1522	0.5460	0.0824	-40	-73
63 Tauri	5.7	-0.31	-10.0	+16 35.8	3 57.8	+1 25.7	-0.2914	0.5461	+0.0821	+18	-41
64 Tauri	4.9	0.31	9.8	17 15.8	4 16.9	+1 44.3	-1.0001	0.5462	0.0816	-26	-73
70 Tauri	6.4	0.31	10.2	15 45.8	5 2.3	+2 28.2	+0.7116	0.5464	0.0806	+90	+16
71 Tauri	4.6	0.31	10.3	15 26.5	5 23.5	+2 48.7	+1.0934	0.5466	0.0801	+90	+43
75 Tauri	5.2	0.30	10.1	16 11.1	6 23.6	+3 46.9	+0.3550	0.5469	0.0787	+57	-4
θ^1 Tauri	4.2	-0.30	-10.2	+15 47.4	6 27.6	+3 50.8	+0.7956	0.5469	+0.0787	+90	+21
θ^2 Tauri	3.6	0.30	10.2	15 41.9	6 30.2	+3 53.3	+0.8993	0.5469	0.0786	+90	+28
θ Tauri	5.8	0.30	10.3	15 28.1	7 13.1	+4 34.9	+1.2080	0.5471	0.0776	+90	+55
264 B. Tauri	4.8	0.30	10.2	16 1.5	7 24.8	+4 46.2	+0.6112	0.5472	0.0773	+80	+11
81 Tauri	5.5	0.30	10.3	15 31.4	7 27.7	+4 49.0	+1.1669	0.5472	0.0773	+90	+51
85 Tauri	6.0	-0.30	-10.3	+15 41.1	8 2.6	+5 22.7	+1.0332	0.5473	+0.0764	+90	+38

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
275 B. Tauri	6.5	-0.29	-10.2	+16 9.6	19	8	53.4	+ 6 12.0	+0.5753	0.5477	+0.0752	+76 + 9	
α Tauri (<i>Aldebar.</i>)	1.1	0.28	10.2	16 21.2		9	58.9	+ 7 15.3	+0.4446	0.5480	0.0737	+64 + 1	
89 Tauri	5.8	0.27	10.3	15 52.6		11	3.6	+ 8 18.0	+1.0450	0.5483	0.0722	+90 +40	
σ^2 Tauri	4.9	0.28	10.4	15 45.8		11	35.8	+ 8 49.1	+1.2081	0.5484	0.0714	+90 +56	
318 B. Tauri	5.7	0.22	10.3	17 1.9		20	11.8	- 6 51.5	+0.3769	0.5510	0.0588	+59 - 1	
<i>m</i> Tauri	5.0	-0.17	-10.0	+18 32.4	20	0	54.7	- 2 17.9	1.0126	0.5523	+0.0516	-28 -72	
111 Tauri	5.1	0.13	10.4	17 18.6		8	54.4	+ 5 36.3	+0.6937	0.5546	0.0392	+90 +19	
115 Tauri	5.3	0.12	10.3	17 53.7		10	11.4	+ 6 40.7	+0.1060	0.5549	0.0372	+11 -13	
117 Tauri	6.0	0.12	10.6	17 10.4		10	36.1	+ 7 4.4	+0.9070	0.5550	0.0365	+90 +33	
119 Tauri	4.9	0.10	10.2	18 32.1		12	31.9	+ 8 56.5	-0.5090	0.5555	0.0335	+ 6 -51	
167 H ¹ . Tauri	5.5	-0.10	-10.6	+16 59.9		12	34.0	+ 8 58.5	+1.1643	0.5555	+0.0334	+90 +55	
120 Tauri	5.6	0.10	10.2	18 29.0		13	8.7	+ 9 32.1	-0.4325	0.5557	0.0325	+10 -45	
122 Tauri	5.5	0.09	10.7	16 59.5		14	48.5	+11 8.5	+1.2430	0.5561	0.0298	+87 +65	
130 Tauri	5.6	-0.05	10.5	17 41.9		19	36.5	- 8 13.0	+0.5968	0.5573	0.0220	+79 +15	
19 B. Geminorum	6.2	+0.05	10.4	18 41.9	21	7	36.2	+ 3 22.5	0.3419	0.5601	0.0021	+15 -36	
124 H ¹ . Orionis	5.7	+0.06	-10.6	+17 55.6		8	2.2	+ 3 47.6	+0.4929	0.5602	+0.0013	+68 +12	
71 Orionis	5.1	0.06	10.2	19 10.9		8	11.5	+ 3 56.6	-0.8615	0.5602	+0.0011	-16 -71	
B. D. +17°1191	6.5	0.06	10.8	17 12.3		8	55.5	+ 4 39.2	+1.2715	0.5604	-0.0002	+76 +72	
287 B. Orionis	6.2	0.07	10.8	17 21.2		10	7.6	+ 5 48.8	+1.1093	0.5606	0.0022	+90 +52	
292 B. Orionis	6.5	0.08	10.6	17 47.9		11	12.9	+ 6 51.9	+0.6264	0.5608	0.0040	+82 +19	
26 Geminorum	5.2	+0.17	-10.8	+17 43.1		20	45.0	- 7 55.4	+0.5931	0.5627	-0.0202	+78 +15	
74 B. Geminorum	6.2	0.19	10.6	18 16.5		22	59.9	- 5 45.1	-0.0537	0.5631	0.0241	+31 -21	
110 B. Geminorum	6.2	0.25	10.7	17 51.8	22	5	47.4	+ 0 48.5	+0.1844	0.5643	0.0357	+46 - 9	
λ Geminorum	3.6	0.32	11.1	16 40.6		12	51.1	+ 7 37.6	+1.1515	0.5653	0.0477	+90 +52	
162 B. Geminorum	5.7	0.39	10.8	17 14.9		18	59.0	-10 27.2	+0.2179	0.5662	0.0581	+48 - 9	
<i>f</i> Geminorum	5.3	+0.42	-10.6	+17 50.9		22	24.3	- 7 8.9	0.6261	0.5666	-0.0639	- 1 -64	
1 Cancr	6.0	0.50	11.2	15 59.6	23	6	14.4	+ 0 24.8	+0.7807	0.5675	0.0769	+90 +21	
2 B. Cancr	6.0	0.51	10.9	16 43.5		6	54.7	+ 1 3.7	-0.0411	0.5676	0.0780	+32 -25	
3 Cancr	5.7	0.52	10.6	17 31.1		7	54.6	+ 2 1.5	-0.9552	0.5677	0.0796	-23 -73	
5 Cancr	5.9	0.52	10.9	16 39.9		8	14.3	+ 2 20.6	0.0843	0.5677	0.0802	+30 -28	
29 Cancr	5.9	+0.66	-11.5	+14 27.8		20	18.1	-10 0.9	+1.1367	0.5689	-0.0995	+90 +46	
90 B. Cancr	6.3	0.69	11.1	15 34.7		23	36.8	- 6 49.2	-0.3655	0.5692	0.1047	+14 -48	
54 Cancr	6.3	0.76	10.9	15 38.1	24	6	12.2	- 0 27.6	1.1441	0.5697	0.1147	-38 -75	
ξ Leonis	5.1	0.96	11.8	11 38.3	25	0	16.4	- 7 1.5	+0.6782	0.5713	0.1401	+87 + 8	
18 Leonis	5.8	1.03	11.4	12 9.7		6	36.5	- 0 54.8	-0.7712	0.5719	0.1480	- 9 -78	
19 Leonis	6.4	+1.03	-11.4	+11 55.3		7	4.1	- 0 28.1	-0.5936	0.5720	-0.1486	+ 2 -69	
<i>R</i> Leonis (<i>var.</i>)	4.6	1.04	11.5	11 47.0		7	7.4	- 0 24.9	-0.4603	0.5720	0.1487	+ 9 -59	
<i>A</i> Leonis	4.6	1.14	11.6	10 22.3		16	2.9	+ 8 11.6	-0.3937	0.5729	0.1591	+13 -55	
44 Leonis	5.9	1.22	11.6	9 10.4		23	37.7	- 8 29.7	-0.4129	0.5739	0.1670	+12 -58	
48 Leonis	5.2	1.28	11.9	7 20.8	26	3	48.1	- 4 28.3	+0.7267	0.5745	0.1710	+90 + 8	
49 Leonis	5.7	+1.27	-11.4	+ 9 2.7		3	53.6	- 4 23.0	-1.0028	0.5745	-0.1711	-24 -81	
37 Sextantis	6.3	1.33	11.8	6 46.6		8	42.6	+ 0 15.7	+0.4500	0.5752	0.1754	+63 - 8	
56 Leonis	6.1	1.37	11.6	6 35.6		13	1.2	+ 4 25.0	-0.1302	0.5758	0.1788	+27 -41	
<i>c</i> Leonis	5.1	1.39	11.5	6 30.7		15	4.0	+ 6 23.4	-0.4161	0.5762	0.1804	+12 -59	
80 Leonis	6.4	1.51	11.4	4 16.9	27	1	53.9	- 7 9.9	-0.1776	0.5782	0.1873	+25 -44	
83 Leonis	6.3	+1.51	-11.5	+ 3 25.8		2	19.2	- 6 45.5	+0.5915	0.5783	-0.1875	+75 - 2	
τ Leonis	5.2	1.53	11.6	3 16.6		2	48.0	- 6 17.6	+0.6531	0.5784	0.1878	+82 + 2	
89 Leonis	5.7	1.55	11.3	3 29.1		5	34.1	- 3 37.7	-0.0755	0.5790	0.1891	+30 -39	
β Virginis	3.8	1.64	11.1	2 11.7		12	31.4	+ 3 4.6	-0.1201	0.5805	0.1918	+28 -41	
27 B. Virginis	6.5	1.66	11.0	+ 0 57.4		16	7.0	+ 6 32.3	+0.4164	0.5814	0.1928	+61 -12	
13 Virginis	5.9	+1.75	-10.5	- 0 21.7	28	0	26.0	- 9 27.1	+0.1079	0.5835	-0.1941	+41 -29	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	α'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
η Virginis	4.0	+1.75	-10.4	0 14.5	28 0 57.5	- 8 56.6	-0.1127	0.5836	-0.1942	+28	-41
γ Virginis (<i>mean</i>)	2.9	1.81	9.6	1 1.8	10 7.7	0 6.7	-1.1146	0.5862	0.1937	-33	-90
38 Virginis	6.1	1.88	9.5	3 8.2	14 55.8	+ 4 30.8	+0.0291	0.5875	0.1927	+36	-33
91 G. Virginis	6.5	1.89	9.6	3 48.5	15 6.3	+ 4 40.8	+0.6539	0.5876	0.1926	+81	+ 1
k Virginis	5.7	1.90	9.2	3 24.0	17 37.0	+ 7 5.9	-0.2302	0.5883	0.1918	+22	-48
46 Virginis	6.1	+1.90	- 9.1	2 57.4	18 0.6	+ 7 28.5	-0.7393	0.5885	-0.1917	- 7	-90
48 Virginis	6.5	1.91	9.0	3 15.1	19 23.0	+ 8 47.9	-0.7135	0.5889	0.1913	- 6	-90
SATURN	0.6	...	...	3 26.7	19 26.7	+ 8 51.5	-0.5349	0.5917	0.1923	+ 5	-70
θ Virginis	4.4	1.95	9.0	5 7.8	21 53.0	+11 12.3	+0.6524	0.5896	0.1902	+80	+ 1
65 Virginis	6.0	1.97	8.2	4 31.5	29 3 24.3	- 7 28.8	0.9850	0.5913	0.1875	-24	-90
66 Virginis	5.7	+1.98	- 8.2	4 45.9	3 54.4	- 6 59.9	-0.8442	0.5915	-0.1872	-14	-90
72 Virginis	6.1	2.01	8.0	6 4.5	6 19.2	- 4 40.5	-0.0103	0.5922	0.1858	+33	-35
l Virginis	4.8	2.00	7.9	5 51.6	6 57.4	- 4 3.7	-0.3386	0.5924	0.1854	+15	-55
88 Virginis	6.5	2.04	7.1	6 27.3	13 38.0	+ 2 21.6	0.9779	0.5944	0.1805	-24	-90
598 B. Virginis	6.1	2.07	6.8	7 40.9	16 20.7	+ 4 58.1	-0.2646	0.5952	0.1782	+18	-50
623 B. Virginis	6.5	+2.10	- 6.4	8 53.4	20 8.6	+ 8 37.3	+0.2457	0.5963	-0.1748	+46	-21
95 Virginis	5.4	2.10	6.2	8 56.9	21 5.9	+ 9 32.4	+0.1361	0.5967	0.1739	+40	-27
96 Virginis	6.5	2.12	6.1	9 58.3	22 1.0	+10 25.4	+0.9783	0.5969	0.1730	+81	+22
λ Virginis	4.3	2.12	5.9	9 55.1	23 35.1	+11 55.9	+0.6550	0.5974	0.1714	+77	+ 2
4 G. Libræ	6.5	2.16	5.2	11 19.3	30 4 19.4	- 7 30.9	+1.2290	0.5987	0.1663	+79	+46
6 B. Libræ	6.2	+2.16	- 4.4	-11 58.8	9 16.9	- 2 44.9	+1.0630	0.6000	-0.1603	+79	+29
22 B. Libræ	6.4	2.19	3.9	12 31.1	13 36.3	+ 1 24.4	+0.9094	0.6011	0.1547	+78	+18
13 Libræ	5.7	2.17	3.5	11 35.2	16 11.4	+ 3 53.5	-0.3985	0.6016	0.1511	+ 8	-60
ξ^2 Libræ	5.6	+2.17	- 3.3	-11 6.0	17 8.5	+ 4 48.3	-1.0172	0.6019	-0.1498	-31	-90

MAY.

γ Libræ	4.0	+2.20	- 0.8	-14 32.0	1 8 26.2	- 4 30.1	+0.2369	0.6046	-0.1260	+41	-21
190 B. Libræ	6.5	2.20	0.4	14 47.8	11 32.4	- 1 31.1	+0.1137	0.6049	0.1207	+33	-28
η Libræ	5.5	2.20	- 0.2	15 25.7	11 47.7	- 1 16.6	+0.7050	0.6050	0.1202	+74	+ 5
195 B. Libræ	6.2	+2.17	+ 0.1	-13.54.1	14 47.1	+ 1 35.7	-1.1516	0.6052	-0.1150	-46	-90
202 B. Libræ	6.4	2.17	0.3	14 10.4	16 35.2	+ 3 19.5	-1.0883	0.6053	0.1117	-41	-90
203 B. Libræ	6.2	2.18	0.4	14 36.3	16 42.3	+ 3 26.3	-0.6766	0.6053	0.1115	-12	-88
48 Libræ	4.6	2.16	0.5	14 3.5	17 21.3	+ 4 3.9	-1.2884	0.6054	0.1103	-69	-79
49 Libræ	5.4	2.18	0.7	16 18.4	18 11.5	+ 4 52.1	+0.8405	0.6054	0.1088	+74	+14
ϕ Ophiuchi	4.4	+2.13	+ 2.7	-16 26.7	2 6 15.6	- 7 32.7	-0.1972	0.6054	-0.0858	+12	-47
24 Scorpii	5.0	2.12	3.5	17 35.6	10 20.5	- 3 37.5	+0.6107	0.6050	0.0777	+63	0
78 B. Ophiuchi	6.5	2.07	4.1	16 41.0	16 2.1	+ 1 50.6	-0.7054	0.6043	0.0662	-18	-90
90 B. Ophiuchi	6.5	2.07	4.5	18 7.7	17 28.8	+ 3 13.9	+0.6436	0.6041	0.0632	+65	+ 2
29 Ophiuchi	6.4	2.08	4.8	18 46.3	18 18.4	+ 4 1.5	+1.2353	0.6040	0.0616	+72	+53
125 B. Ophiuchi	6.2	+2.04	+ 4.9	-17 30.4	20 50.6	+ 6 27.7	-0.1785	0.6035	-0.0563	+11	-46
164 B. Ophiuchi	6.0	2.00	5.5	17 40.5	3 1 26.6	+10 52.8	-0.2478	0.6025	0.0469	+ 6	-50
192 B. Ophiuchi	6.3	1.99	5.9	18 22.4	3 18.4	-11 19.7	+0.3695	0.6020	0.0430	+42	-14
305 B. Ophiuchi	6.3	1.87	7.5	18 47.2	15 47.2	+ 0 39.8	+0.4146	0.5980	0.0172	+43	-11
64 B. Sagittarii	6.1	1.77	8.2	18 41.0	23 41.9	+ 8 16.2	+0.2393	0.5948	-0.0011	+29	-21
6 B. Scuti	5.9	+1.75	+ 8.0	-17 23.9	4 0 23.9	+ 8 56.7	-1.0692	0.5945	+0.0004	-49	-90
52 G. Sagittarii	6.4	1.76	8.2	18 29.4	0 29.9	+ 9 2.4	+0.0417	0.5944	0.0006	+18	-32
17 H. Sagittarii	6.4	1.76	8.3	18 38.9	1 0.1	+ 9 31.5	+0.2032	0.5942	0.0016	+27	-23
Y Sagittarii (<i>var.</i>)	5.4	1.74	8.5	18 53.6	2 4.9	+10 33.7	+0.4560	0.5937	0.0038	+44	- 9
85 B. Sagittarii	6.0	1.70	8.5	17 50.7	4 46.3	-10 51.0	-0.5953	0.5925	0.0091	-17	-78
95 B. Sagittarii	5.7	+1.70	+ 8.8	-18 46.6	5 40.9	- 9 58.5	+0.3642	0.5920	+0.0109	+39	-14

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y''</i>	<i>x'</i>	<i>y'</i>	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
100 B. Sagittarii	5.0	+1.69	+ 8.7	-18 27.3	4 6 11.7	- 9 28.9	+0.0411	0.5918	+0.0119	+19	-32
173 B. Sagittarii	6.4	1.52	9.9	19 12.7	19 18.8	+ 3 8.8	+1.1488	0.5849	0.0372	+71	+41
187 B. Sagittarii	6.4	1.50	9.9	18 51.3	21 0.5	+ 4 46.7	+0.8471	0.5840	0.0403	+72	+15
ρ Sagittarii	4.0	1.41	10.0	17 59.4	5 3 10.3	+10 42.9	+0.2374	0.5803	0.0514	+34	-21
45 Sagittarii	6.0	1.41	10.1	18 27.0	3 14.1	+10 46.5	+0.7163	0.5803	0.0516	+71	+ 7
267 B. Sagittarii	5.8	+1.32	+10.4	-18 24.0	9 45.6	- 6 56.1	+1.0430	0.5763	+0.0629	+72	+30
54 Sagittarii	5.4	1.29	9.8	16 28.1	11 22.1	- 5 23.0	-0.8676	0.5753	0.0656	-28	-90
ϵ Sagittarii	5.2	1.28	9.8	16 18.2	12 8.9	+ 4 37.9	-0.9889	0.5748	0.0669	-36	-90
g Sagittarii	5.1	1.19	9.7	15 41.6	18 54.1	+ 1 52.9	-1.1418	0.5706	0.0778	-48	-90
16 B. Capricorni	6.2	1.05	9.7	15 1.6	6 5 4.1	+11 41.7	-0.9811	0.5642	0.0932	-33	-90
β Capricorni	3.2	+1.05	+ 9.7	-15 1.4	5 10.5	+11 47.9	-0.9745	0.5641	+0.0933	-32	-90
31 B. Capricorni	6.4	1.00	10.0	15 59.7	8 39.1	- 8 50.6	+0.3846	0.5619	0.0983	+48	-13
27 G. Capricorni	6.2	0.99	9.8	15 18.7	9 43.6	- 7 48.3	-0.2308	0.5612	0.0997	+13	-49
τ Capricorni	5.2	0.94	9.7	15 13.4	13 28.4	+ 4 11.1	+0.0576	0.5589	0.1048	+29	-32
95 B. Capricorni	5.9	0.82	9.5	14 46.7	22 28.8	+ 4 31.3	+0.5823	0.5533	0.1162	+65	- 2
53 B. Aquarii	6.5	+0.72	+ 8.9	-13 31.2	7 6 39.1	-11 34.4	+0.2259	0.5485	+0.1255	+42	-22
18 Aquarii	5.5	0.68	8.7	13 12.4	10 34.2	- 7 46.9	+0.3909	0.5463	0.1297	+53	-13
72 B. Aquarii	6.5	0.66	8.2	11 54.0	12 31.6	- 5 53.2	-0.7584	0.5452	0.1317	-13	-90
137 B. Capricorni	6.2	0.60	7.6	10 55.3	17 58.9	- 0 36.1	-1.0822	0.5423	0.1370	-36	-90
λ Capricorni	5.5	0.55	7.8	11 43.2	21 25.7	+ 2 44.0	+0.2560	0.5405	0.1401	+45	-20
96 B. Aquarii	6.5	+0.52	+ 7.3	-10 40.4	8 0 54.8	+ 6 6.6	-0.3825	0.5387	+0.1431	+10	-59
150 B. Aquarii	6.0	0.40	6.3	9 25.3	12 32.1	- 6 37.4	-0.0235	0.5334	0.1521	+30	-36
ρ Aquarii	5.3	0.39	5.8	8 12.4	14 12.9	- 4 59.8	-1.0908	0.5327	0.1533	-34	-90
167 G. Aquarii	6.3	0.29	5.3	8 17.8	23 27.2	+ 3 58.0	+0.4491	0.5290	0.1590	+61	-10
213 B. Aquarii	6.5	0.26	5.3	8 42.8	9 1 51.7	+ 6 18.1	+1.2903	0.5282	0.1604	+82	+55
67 Aquarii	6.4	+0.28	+ 4.9	- 7 21.9	1 57.6	+ 6 23.8	-0.1689	0.5281	+0.1604	+23	-45
λ Aquarii	3.8	0.22	4.7	7 59.3	6 47.6	+11 5.2	+1.2961	0.5265	0.1629	+82	+56
78 Aquarii	6.3	0.21	4.6	7 36.8	7 48.4	-11 55.8	+1.0504	0.5262	0.1634	+83	+28
252 B. Aquarii	5.8	0.23	3.9	5 23.8	8 8.0	-11 36.8	-1.3265	0.5261	0.1635	-66	-78
263 B. Aquarii	6.1	0.20	3.6	5 7.5	11 25.8	- 8 24.7	-1.0853	0.5251	0.1650	-32	-90
82 Aquarii	6.4	+0.18	+ 4.1	- 6 59.2	11 57.0	- 7 54.5	+1.0454	0.5250	+0.1652	+84	+27
293 B. Aquarii	5.5	0.15	2.7	3 54.9	18 46.0	+ 1 17.4	-1.1956	0.5232	0.1678	-42	-90
URANUS	6.2	...	...	5 54.6	19 16.9	- 0 47.4	+1.0863	0.5218	0.1675	+85	+30
96 Aquarii	5.7	0.12	3.1	5 32.7	20 45.6	+ 0 38.7	+0.9326	0.5227	0.1685	+85	+19
316 B. Aquarii	6.5	0.13	2.6	4 20.3	21 12.8	+ 1 5.2	-0.3192	0.5226	0.1686	+17	-54
337 B. Aquarii	6.4	+0.08	+ 2.5	- 4 57.1	10 2 5.9	+ 5 49.6	+1.1846	0.5216	+0.1701	+86	+40
342 B. Aquarii	6.5	0.07	2.3	4 30.4	3 9.0	+ 6 50.9	+0.8744	0.5214	0.1703	+86	+15
20 Piscium	5.6	+0.01	1.4	3 11.4	11 51.1	- 8 42.0	+0.9113	0.5200	0.1721	+87	+17
80 B. Piscium	6.3	-0.04	+ 0.1	0 55.8	20 58.0	+ 0 9.3	-0.0127	0.5191	0.1731	+34	-35
98 B. Piscium	6.3	0.06	-1.0	+ 1 15.6	11 3 45.5	+ 6 45.3	-1.2644	0.5187	0.1733	-49	-89
44 Piscium	6.0	-0.09	-1.3	+ 1 30.8	7 49.6	+10 42.4	-0.8401	0.5187	+0.1731	-13	-89
155 B. Piscium	6.5	0.16	2.6	2 58.0	21 39.7	+ 0 9.0	-0.0694	0.5192	0.1713	+31	-38
77 Piscium	6.4	0.19	3.5	4 29.9	12 5 23.8	+ 7 39.8	-0.4531	0.5200	0.1694	+10	-63
ϵ Piscium	5.6	0.20	3.8	5 14.5	6 45.8	+ 8 59.4	-1.0486	0.5201	0.1689	-27	-85
VENUS	-3.4	...	...	6 3.7	12 35.5	- 9 20.9	-0.9833	0.4703	0.1465	-23	-84
μ Piscium	5.0	-0.24	-4.6	+ 5 44.8	18 18.9	- 3 47.3	+0.3189	0.5219	+0.1647	+54	-16
NEW MOON.											
111 Tauri	5.1	-0.30	-10.3	+17 18.6	17 14 35.0	-11 5.9	+0.8403	0.5572	+0.0410	+90	+28
115 Tauri	5.3	0.30	10.2	17 53.7	15 51.5	- 9 52.0	+0.2546	0.5576	0.0389	+50	- 5
117 Tauri	6.0	-0.30	-10.4	+17 10.4	16 16.0	- 9 28.2	+1.0561	0.5576	+0.0383	+90	+44

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"		d h m	h m					
119 Tauri	4.9	-0.29	-10.2	18 32.1	17 18 11.2	- 7 36.9	-0.3568	0.5581	+0.0352	+14	-40
120 Tauri	5.6	0.29	10.2	18 29.0	18 47.8	- 7 1.5	-0.2795	0.5582	0.0342	+19	-35
130 Tauri	5.6	0.27	10.3	17 41.9	18 1 13.6	- 0 48.5	+0.7591	0.5597	0.0236	+90	+25
64 Orionis	5.1	0.23	10.0	19 41.4	8 32.7	+ 6 15.8	-1.2724	0.5612	0.0113	-69	-71
19 B. Geminorum	6.2	0.21	10.2	18 41.9	13 10.4	+10 44.2	-0.1640	0.5620	0.0035	+25	-25
124 II ^t . Orionis	5.7	-0.21	-10.4	+17 55.6	13 36.4	+11 9.3	+0.6726	0.5621	+0.0027	+89	+22
71 Orionis	5.1	0.21	10.2	19 10.9	13 45.6	+11 18.3	-0.6836	0.5621	+0.0025	- 5	-65
292 B. Orionis	6.5	0.19	10.4	17 47.9	16 46.6	- 9 47.1	+0.8104	0.5626	-0.0027	+90	+30
26 Geminorum	5.2	0.14	10.4	17 43.1	19 2 17.9	- 0 35.1	+0.7891	0.5638	0.0191	+90	+27
74 B. Geminorum	6.2	0.12	10.2	18 16.5	4 32.8	+ 1 35.1	+0.1431	0.5641	0.0229	+43	-10
110 B. Geminorum	6.2	-0.08	-10.2	+17 51.8	11 20.7	+ 8 9.2	+0.3894	0.5647	-0.0346	+60	+ 3
162 B. Geminorum	5.7	+0.03	10.2	17 14.9	20 0 35.2	- 3 3.6	+0.4362	0.5654	0.0571	+64	+ 3
f Geminorum	5.3	0.05	9.9	17 50.9	4 1.7	+ 0 15.9	-0.4096	0.5655	0.0629	+12	-47
1 Cancr	6.0	0.12	10.3	15 59.7	11 55.5	+ 7 53.4	+1.0123	0.5655	0.0759	+90	+37
2 B. Cancr	6.0	0.13	10.0	16 43.5	12 36.2	+ 8 32.8	+0.1853	0.5656	0.0770	+46	-13
3 Cancr	5.7	+0.13	- 9.8	+17 31.1	13 36.7	+ 9 31.0	-0.7346	0.5655	-0.0786	- 7	-73
5 Cancr	5.9	0.14	10.0	16 40.0	13 56.6	+ 9 50.3	+0.1427	0.5655	0.0792	+43	-15
90 B. Cancr	6.3	0.29	9.9	15 34.7	21 5 30.6	+ 0 52.1	-0.1324	0.5652	0.1035	+27	-33
54 Cancr	6.3	0.36	9.6	15 38.1	12 12.5	+ 7 20.2	-0.9169	0.5650	0.1134	-19	-75
o ¹ Cancr	5.1	0.39	9.5	15 37.0	15 0.0	+10 1.9	-1.2186	0.5650	0.1174	-47	-75
ξ Leonis	5.1	+0.58	-10.2	+11 38.3	22 6 39.1	+ 1 8.8	+0.9282	0.5645	-0.1384	+90	+24
18 Leonis	5.8	0.65	9.7	12 9.8	13 8.6	+ 7 24.9	-0.5406	0.5644	0.1463	+ 5	-65
19 Leonis	6.4	0.65	9.8	11 55.3	13 37.0	+ 7 52.3	-0.3607	0.5644	0.1468	+15	-52
R Leonis (var.)	4.6	0.65	9.8	11 47.0	13 40.3	+ 7 55.5	-0.2257	0.5644	0.1469	+22	-43
A Leonis	4.6	0.77	9.9	10 22.4	22 50.5	- 7 13.1	-0.1612	0.5645	0.1571	+26	-41
44 Leonis	5.9	+0.87	- 9.8	+ 9 10.4	23 6 38.8	+ 0 19.0	-0.1846	0.5648	-0.1649	+25	-43
ρ Leonis	3.8	0.90	9.4	9 42.0	10 2.4	+ 3 35.5	-1.2885	0.5649	0.1680	-55	-81
48 Leonis	5.2	0.93	10.2	7 20.9	10 56.9	+ 4 28.2	+0.9695	0.5650	0.1688	+90	+24
49 Leonis	5.7	0.92	9.6	9 2.8	11 2.7	+ 4 33.8	-0.7864	0.5650	0.1689	-10	-81
37 Sextantis	6.3	1.00	10.1	6 46.6	16 1.0	+ 9 21.8	+0.6851	0.5653	0.1731	+87	+ 5
56 Leonis	6.1	+1.05	- 9.8	+ 6 35.6	20 28.0	-10 20.3	+0.0921	0.5657	-0.1766	+40	-28
c Leonis	5.1	1.08	9.7	6 30.8	22 35.0	- 8 17.8	-0.2002	0.5660	0.1781	+24	-45
80 Leonis	6.4	1.23	9.6	4 16.9	9 47.3	+ 2 31.2	+0.0300	0.5675	0.1849	+37	-33
83 Leonis	6.3	1.22	9.8	3 25.8	10 13.5	+ 2 56.5	+0.8111	0.5676	0.1852	+90	+11
τ Leonis	5.2	1.25	9.9	3 16.7	10 43.4	+ 3 25.4	+0.8731	0.5677	0.1854	+90	+15
89 Leonis	5.7	+1.28	- 9.6	+ 3 29.1	13 35.3	+ 6 11.3	+0.1292	0.5681	-0.1868	+42	-27
β Virginis	3.8	1.40	9.5	2 11.8	20 47.4	-10 51.7	+0.0740	0.5696	0.1896	+39	-30
27 B. Virginis	6.5	1.43	9.5	+ 0 57.4	9 0 30.7	- 7 16.1	+0.6138	0.5704	0.1906	+78	- 1
13 Virginis	5.9	1.55	9.1	- 0 21.7	9 7.2	+ 1 2.2	+0.2866	0.5726	0.1921	+52	-19
η Virginis	4.0	1.55	9.0	0 14.5	9 39.8	+ 1 33.6	+0.0615	0.5728	0.1922	+38	-31
γ Virginis (mean)	2.9	+1.65	- 8.2	- 1 1.8	19 9.0	+10 42.6	-0.9724	0.5756	-0.1920	-22	-90
38 Virginis	6.1	1.74	8.3	3 8.2	26 0 6.7	- 8 30.5	+0.1788	0.5772	0.1912	+45	-25
91 G. Virginis	6.5	1.76	8.5	3 48.5	0 17.5	- 8 20.1	+0.8124	0.5773	0.1911	+87	+11
SATURN	0.8	...	...	2 57.6	2 26.4	- 6 15.8	-0.4413	0.5796	0.1911	+10	-63
k Virginis	5.7	1.78	8.0	3 24.0	2 53.2	- 5 49.9	-0.0898	0.5782	0.1905	+29	-40
46 Virginis	6.1	+1.78	- 7.8	- 2 57.4	3 17.4	- 5 26.7	-0.6069	0.5784	-0.1904	+ 1	-77
48 Virginis	6.5	1.80	7.8	3 15.1	4 42.5	- 4 4.6	-0.5835	0.5788	0.1899	+ 2	-75
θ Virginis	4.4	1.85	8.0	5 7.8	7 17.2	- 1 35.5	+0.7962	0.5798	0.1891	+85	+10
65 Virginis	6.0	1.90	7.1	4 31.4	12 58.6	+ 3 53.4	-0.8753	0.5819	0.1866	-16	-90
66 Virginis	5.7	1.92	7.1	4 45.8	13 29.7	+ 4 23.4	-0.7336	0.5821	0.1863	- 7	-90
72 Virginis	6.1	+1.96	- 7.1	- 6 4.5	15 58.7	+ 6 47.0	+0.1056	0.5830	-0.1850	+40	-29

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.			
Name.		Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
			Δα	Δδ									
			s	"	°	d	h	m	h	m		°	
l	Virginis	4.8	+1.96	-7.0	5 51.6	26	16	38.0	+7 24.9	-0.2282	0.5833	-0.1847	+21 -48
88	Virginis	6.5	2.03	6.2	6 27.3		23	29.6	-9 58.7	-0.8901	0.5860	0.1802	-18 -90
598 B.	Virginis	6.1	2.07	6.1	7 40.9	27	2	16.6	-7 17.9	-0.1749	0.5871	0.1781	+23 -45
623 B.	Virginis	6.5	2.13	5.8	8 53.4		6	10.1	+3 33.1	+0.3321	0.5887	0.1749	+52 -16
95	Virginis	5.4	2.13	5.6	8 56.9		7	8.8	-2 36.6	+0.2190	0.5891	0.1740	+45 -23
96	Virginis	6.5	+2.16	-5.7	9 58.3		8	5.1	-1 42.4	+1.0677	0.5895	-0.1731	+81 +29
κ	Virginis	4.3	2.17	5.4	9 55.0		9	41.4	-0 9.7	+0.7369	0.5901	0.1716	+81 +6
4 G.	Libræ	6.5	2.24	5.0	11 19.3		14	31.9	+4 29.8	+1.3041	0.5921	0.1668	+78 +60
6 B.	Libræ	6.2	2.26	4.2	11 58.8		19	35.3	+9 21.7	+1.1233	0.5941	0.1611	+79 +34
22 B.	Libræ	6.4	2.33	3.7	12 31.0		23	59.2	-10 24.5	+0.9569	0.5959	0.1558	+78 +21
13	Libræ	5.7	+2.33	-3.1	-11 35.2	28	2	36.8	-7 53.0	-0.3669	0.5968	-0.1524	+10 -58
ξ ²	Libræ	5.6	2.33	2.9	11 6.0		3	34.7	-6 57.3	-0.9922	0.5972	0.1511	-28 -90
γ	Libræ	4.0	2.47	0.7	14 32.0		19	2.6	+7 54.4	+0.2315	0.6023	0.1280	+41 -22
190 B.	Libræ	6.5	2.48	0.2	14 47.8		22	10.1	+10 51.6	+0.1001	0.6032	0.1228	+32 -29
η	Libræ	5.5	2.49	-0.2	15 25.7		22	25.4	+11 9.3	+0.6924	0.6033	0.1224	+74 +4
195 B.	Libræ	6.2	+2.48	+0.4	-13 54.1	29	1	25.7	-9 57.5	-1.1762	0.6040	-0.1172	-48 -90
202 B.	Libræ	6.4	2.48	0.7	14 10.4		3	14.2	-8 13.3	-1.1168	0.6045	0.1140	-43 -90
203 B.	Libræ	6.2	2.49	0.7	14 36.3		3	21.3	-8 6.5	-0.7046	0.6045	0.1138	-13 -90
49	Libræ	5.4	2.51	0.7	16 18.4		4	50.8	-6 40.4	+0.8115	0.6048	0.1111	+74 +12
φ	Ophiuchi	4.1	2.54	3.0	16 26.7		16	54.5	+4 54.5	-0.2563	0.6068	0.0884	+9 -51
24	Scorpii	5.0	+2.56	+3.7	-17 35.6		20	58.4	+8 48.6	+0.5409	0.6071	-0.0803	+57 -4
78 B.	Ophiuchi	6.5	2.54	4.6	16 41.0	30	2	37.6	-9 45.7	-0.7854	0.6073	0.0688	-23 -90
90 B.	Ophiuchi	6.5	2.56	4.8	18 7.7		4	3.6	-8 23.1	+0.5564	0.6073	0.0658	+58 -3
29	Ophiuchi	6.4	2.57	5.0	18 46.3		4	52.8	-7 35.9	+1.1442	0.6072	0.0641	+72 +40
125 B.	Ophiuchi	6.2	2.54	5.4	17 30.4		7	23.4	-5 11.3	-0.2707	0.6071	0.0589	+6 -52
164 B.	Ophiuchi	6.0	+2.53	+6.1	-17 40.5		11	56.4	-0 49.1	-0.3498	0.6068	-0.0494	+1 -57
192 B.	Ophiuchi	6.3	2.53	6.5	18 22.4		13	46.8	+0 56.8	+0.2606	0.6066	0.0455	+35 -20
305 B.	Ophiuchi	6.3	2.48	8.4	18 47.2	31	2	4.1	-11 15.2	+0.2782	0.6041	0.0194	+33 -19
64 B.	Sagittarii	6.1	2.42	9.4	18 41.0		9	49.8	-3 47.8	+0.0879	0.6018	0.0030	+21 -29
6 B.	Scuti	5.9	2.40	9.3	17 23.9		10	31.0	-3 8.3	-1.2115	0.6015	0.0015	-63 -90
52 G.	Sagittarii	6.4	+2.42	+9.5	-18 29.4		10	36.8	-3 2.6	-0.1096	0.6015	-0.0013	+9 -41
17 H.	Sagittarii	6.4	2.41	9.6	18 38.9		11	6.4	-2 34.2	+0.0495	0.6013	-0.0003	+18 -32
Y	Sagittarii (var.)	5.4	2.41	9.8	18 53.6		12	9.9	-1 33.2	+0.2981	0.6009	+0.0019	+33 -18
85 B.	Sagittarii	6.0	2.37	9.9	17 50.7		14	47.8	+0 58.5	-0.7495	0.5999	0.0074	-26 -90
95 B.	Sagittarii	5.7	2.38	10.2	18 46.5		15	41.3	+1 50.0	+0.2000	0.5995	0.0093	+28 -23
100 B.	Sagittarii	5.0	+2.37	+10.2	-18 27.2		16	11.4	+2 18.9	-0.1212	0.5993	+0.0103	+10 -42

JUNE.

171 B. Sagittarii	6.1	+2.26	+11.8	-19 21.3	1 4 58.3	-9 23.7	+1.0968	0.5933	+0.0361	+71	+35
173 B. Sagittarii	6.4	+2.26	+11.8	-19 12.7	4 59.8	-9 22.2	+0.9514	0.5933	+0.0361	+71	+23
187 B. Sagittarii	6.4	2.24	11.8	18 51.3	6 38.9	-7 46.9	+0.6498	0.5924	0.0393	+64	+2
190 B. Sagittarii	5.4	2.24	12.0	19 24.5	7 6.4	-7 20.4	+1.2345	0.5921	0.0402	+71	+53
<i>d</i> Sagittarii	5.0	2.20	12.3	19 5.3	10 57.9	-3 37.7	+1.0781	0.5900	0.0476	+71	+33
<i>ρ</i> Sagittarii	4.0	2.17	12.2	17 59.4	12 39.1	-2 0.2	+0.0360	0.5890	0.0508	+22	-33
45 Sagittarii	6.0	+2.17	+12.3	-18 26.9	12 42.8	-1 56.7	+0.5097	0.5890	+0.0509	+52	-6
267 B. Sagittarii	5.8	2.10	12.8	18 24.0	19 3.7	+4 10.0	+0.8221	0.5852	0.0625	+72	+13
54 Sagittarii	5.4	2.07	12.5	16 28.1	20 37.6	+5 40.5	-1.0695	0.5842	0.0653	-43	-90
<i>e</i> Sagittarii	5.2	2.06	12.5	16 18.1	21 23.1	+6 24.2	-1.1906	0.5837	0.0666	-55	-90
16 B. Capricorni	6.2	1.86	13.1	15 1.5	2 13 50.0	-1 44.5	-1.2056	0.5729	0.0936	-54	-90
β Capricorni	3.2	+1.86	+13.1	-15 1.3	13 56.2	-1 38.5	-1.1992	0.5729	+0.0938	-53	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N</i>	<i>S</i> .
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
31 B. Capricorni	6.4	+1.83	+13.5	15 59.6	2 17 19.0	+ 1 37.1	+0.1396	0.5705	+0.0988	+33	-27
27 G. Capricorni	6.2	1.81	13.3	15 18.7	18 21.6	+ 2 37.5	-0.4697	0.5699	0.1004	0	-66
47 B. Capricorni	6.2	1.79	13.8	16 47.3	20 19.1	+ 4 30.9	+1.2753	0.5685	0.1032	+74	+59
τ Capricorni	5.2	1.77	13.4	15 13.3	22 0.1	+ 6 8.4	-0.1891	0.5674	0.1055	+15	-46
61 B. Capricorni	5.9	1.76	13.8	16 23.7	22 33.6	+ 6 40.8	+1.1003	0.5670	0.1063	+74	+34
95 B. Capricorni	5.9	+1.66	+13.4	14 46.6	3 6 45.7	- 9 24.0	+0.3202	0.5614	+0.1172	+46	-17
53 B. Aquarii	6.5	1.56	13.0	13 31.1	14 43.1	- 1 42.6	-0.0391	0.5561	0.1267	+26	-37
18 Aquarii	5.5	1.52	12.9	13 12.4	18 32.2	+ 1 58.9	+0.1212	0.5536	0.1310	+36	-28
72 B. Aquarii	6.5	1.49	12.5	11 53.9	20 26.6	+ 3 49.6	-1.0167	0.5524	0.1330	-31	-90
λ Capricorni	5.5	1.39	12.3	11 43.1	4 5 7.8	-11 46.2	-0.0190	0.5470	0.1415	+29	-36
96 B. Aquarii	6.5	+1.35	+11.9	10 40.3	8 32.1	- 8 28.4	-0.6524	0.5449	+0.1446	- 6	-83
150 B. Aquarii	6.0	1.22	11.2	9 25.3	19 54.5	+ 2 32.6	-0.3011	0.5385	0.1537	+15	-53
167 G. Aquarii	6.3	1.11	10.3	8 17.7	5 6 37.4	-11 4.2	+0.1662	0.5332	0.1605	+42	-26
213 B. Aquarii	6.5	1.08	10.4	8 42.7	8 59.4	- 8 46.5	+1.0002	0.5321	0.1619	+82	+24
67 Aquarii	6.4	1.09	9.9	7 21.8	9 5.3	- 8 40.8	0.4463	0.5321	0.1619	+ 8	-63
λ Aquarii	3.8	+1.03	+ 9.9	7 59.2	13 50.6	- 4 4.1	+1.0071	0.5300	+0.1644	+83	+24
78 Aquarii	6.3	1.02	9.7	7 36.7	14 50.5	- 3 6.1	+0.7636	0.5296	0.1648	+83	+ 8
81 Aquarii	6.4	0.98	9.4	7 28.3	18 20.0	+ 0 17.2	+1.1919	0.5283	0.1664	+83	+41
82 Aquarii	6.4	0.98	9.2	6 59.1	18 55.5	+ 0 51.6	+0.7599	0.5280	0.1666	+84	+ 8
ϕ Aquarii	4.4	0.92	8.6	6 27.7	6 0 59.7	+ 6 45.0	+1.2104	0.5258	0.1690	+84	+42
URANUS	6.2	...	...	5 40.3	3 24.7	+ 9 5.8	+0.7578	0.5245	+0.1696	+85	+ 8
96 Aquarii	5.7	+0.91	+ 8.2	5 32.6	3 37.3	+ 9 18.0	+0.6520	0.5250	0.1699	+80	+ 1
316 B. Aquarii	6.5	0.92	7.7	4 20.2	4 4.3	+ 9 44.2	-0.5908	0.5248	0.1700	+ 2	-76
337 B. Aquarii	6.4	0.86	7.6	4 57.0	8 54.1	- 9 34.5	+0.9056	0.5234	0.1714	+86	+17
342 B. Aquarii	6.5	0.85	7.4	4 30.4	9 56.6	- 8 33.9	+0.5981	0.5231	0.1716	+75	- 2
20 Piscium	5.6	+0.78	+ 6.4	3 11.3	18 34.0	- 0 11.5	+0.6114	0.5211	+0.1734	+80	+ 1
80 B. Piscium	6.3	0.71	5.0	0 55.7	7 3 37.3	+ 8 36.2	-0.2695	0.5195	0.1743	+20	-51
44 Piscium	6.0	0.63	3.4	+ 1 30.9	14 26.0	- 4 53.7	-1.0820	0.5183	0.1742	-30	-89
10 Ceti	6.4	0.61	4.0	0 28.5	15 5.0	+ 4 15.8	+1.2280	0.5183	0.1742	+90	+44
155 B. Piscium	6.5	0.53	1.8	+ 2 58.1	8 4 14.2	+ 8 31.0	-0.2969	0.5181	0.1723	+18	-52
77 Piscium	6.4	+0.48	+ 0.7	+ 4 29.9	11 58.1	- 7 58.3	-0.6680	0.5186	+0.1704	- 2	-82
ϵ Piscium	5.6	0.47	+ 0.4	5 14.6	13 20.1	- 6 38.7	-1.2597	0.5187	0.1700	-48	-85
μ Piscium	5.0	0.39	- 0.6	5 44.9	9 0 53.7	+ 4 34.9	+0.1230	0.5202	0.1658	+42	-27
39 B. Arietis	6.5	0.26	2.4	7 22.0	19 8.3	+ 1 42.1	+1.2722	0.5242	0.1563	+90	+53
64 Ceti	5.8	0.24	3.0	8 12.6	22 31.8	+ 1 35.5	+0.8638	0.5251	0.1541	+90	+17
ξ^1 Ceti	4.5	+0.24	- 3.1	+ 8 29.1	23 22.8	+ 2 25.0	+0.6887	0.5253	+0.1536	+88	+ 6
ξ Arietis	5.5	0.22	3.9	10 15.7	10 5 29.4	+ 8 20.9	-0.3537	0.5272	0.1493	+15	-53
25 Arietis	6.5	0.19	4.0	9 51.4	6 50.2	+ 9 39.3	+0.2954	0.5276	0.1483	+53	-15
389 B. Ceti	6.3	0.19	3.9	9 13.3	7 57.8	+10 44.9	+1.1648	0.5279	0.1474	+90	+41
85 Ceti	6.3	0.15	4.6	10 24.8	14 34.2	- 6 50.4	+0.8023	0.5302	0.1422	+90	+15
38 Arietis	5.2	+0.17	- 5.1	+12 7.3	15 48.8	- 5 38.1	-0.9114	0.5306	+0.1411	-18	-78
147 B. Arietis	5.8	0.10	6.0	12 53.4	11 2 40.5	+ 4 53.9	-0.2790	0.5346	0.1312	+19	-46
30 B. Tauri	6.4	+0.03	7.3	15 10.6	18 16.7	- 3 58.6	-0.8774	0.5408	+0.1147	-16	-75
NEW MOON.											
162 B. Geminorum	5.7	-0.09	- 9.6	+17 14.9	16 6 12.9	+ 4 21.4	+0.6049	0.5697	-0.0558	+80	+13
f Geminorum	5.3	0.08	9.4	17 50.9	9 37.1	+ 7 38.6	-0.2324	0.5697	0.0616	+22	-35
1 Cancr	6.0	0.03	9.5	15 59.7	17 25.8	- 8 49.0	+1.1994	0.5696	0.0748	+90	+55
2 B. Cancr	6.0	0.03	9.3	16 43.5	18 6.1	- 8 10.1	+0.3754	0.5695	0.0759	+59	- 2
3 Cancr	5.7	0.03	9.1	17 31.1	19 5.9	- 7 12.5	-0.5407	0.5695	0.0775	+ 4	-58
5 Cancr	5.9	-0.02	- 9.3	+16 40.0	19 25.6	- 6 53.4	+0.3351	0.5694	-0.0781	+56	- 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.		
Name.		Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
			$\Delta\alpha$	$\Delta\delta$		d	h	m						
			s	"	°	'								
<i>d</i> ²	Cancr	6.2	+0.03	-8.8	+17	17.9	17	6	15.4	+ 3 33.8	-1.2716	0.5687	-0.0955	-59 -73
90 B.	Cancr	6.3	0.08	9.0	15	34.7	10	51.6	+ 8 0.5	+0.0843	0.5683	0.1026	+40 -21	
54	Cancr	6.3	0.12	8.6	15	38.1	17	31.1	- 9 33.8	-0.6911	0.5675	0.1126	- 4 -73	
σ^1	Cancr	5.1	0.15	8.5	15	37.0	20	17.7	- 6 53.1	-0.9895	0.5672	0.1166	-24 -75	
σ^2	Cancr	5.7	0.15	8.4	15	52.5	20	26.6	- 6 44.4	-1.2782	0.5672	0.1168	-58 -75	
ξ	Leonis	5.1	+0.30	-8.8	+11	38.3	18	11	54.6	+ 8 11.6	+1.1779	0.5653	-0.1376	+90 +45
18	Leonis	5.8	0.36	8.3	12	9.8	18	24.7	- 9 31.7	-0.2888	0.5645	0.1455	+19 -47	
19	Leonis	6.4	0.36	8.3	11	55.4	18	53.1	- 9 4.3	-0.1080	0.5645	0.1460	+29 -36	
<i>R</i>	Leonis (<i>var.</i>)	4.6	0.37	8.4	11	47.1	18	56.5	- 9 1.0	+0.0275	0.5644	0.1461	+36 -28	
<i>A</i>	Leonis	4.6	0.47	8.3	10	22.4	19	4	8.9	- 0 7.4	+0.0991	0.5634	0.1562	+41 -26
44	Leonis	5.9	+0.56	-8.1	+ 9	10.5	12	0.6	+ 7 28.2	+0.0798	0.5628	-0.1639	+39 -28	
45	Leonis	5.8	0.57	7.7	10	9.2	13	5.5	+ 8 30.8	-1.1083	0.5627	0.1648	-33 -80	
ρ	Leonis	3.8	0.59	7.7	9	42.1	15	26.2	+10 46.7	-1.0297	0.5625	0.1669	-26 -81	
48	Leonis	5.2	0.62	8.4	7	20.9	16	21.3	+11 40.0	+1.2433	0.5625	0.1677	+90 +49	
49	Leonis	5.7	0.61	7.8	9	2.8	16	27.1	+11 45.6	-0.5241	0.5624	0.1678	+ 6 -66	
37	Sextantis	6.3	+0.69	-8.2	+ 6	46.6	21	28.8	- 7 23.0	+0.9591	0.5621	-0.1719	+90 +22	
56	Leonis	6.1	0.74	8.0	6	35.7	20	1 59.4	- 3 1.6	+0.3628	0.5620	0.1753	+57 -13	
<i>c</i>	Leonis	5.1	0.76	7.9	6	30.8	4	8.1	- 0 57.3	+0.0683	0.5620	0.1767	+39 -30	
80	Leonis	6.4	0.92	7.7	4	16.9	15	32.0	+10 3.4	+0.2998	0.5621	0.1834	+53 -18	
83	Leonis	6.3	0.92	7.9	3	25.9	15	58.6	+10 29.0	+1.0886	0.5621	0.1836	+90 +31	
τ	Leonis	5.2	+0.95	-8.0	+ 3	16.7	16	29.1	+10 58.5	+1.1511	0.5622	-0.1838	+90 +37	
89	Leonis	5.7	0.97	7.7	3	29.2	19	24.5	-10 12.0	+0.3991	0.5623	0.1851	+60 -12	
β	Virginis	3.8	1.10	7.6	2	11.8	21	2 46.0	- 3 5.6	+0.3404	0.5629	0.1878	+56 -16	
27 B.	Virginis	6.5	1.14	7.5	+ 0	57.4	6	34.6	+ 0 35.2	+0.8844	0.5633	0.1888	+90 +16	
13	Virginis	5.9	1.27	7.2	- 0	21.7	15	24.4	+ 9 6.8	+0.5472	0.5646	0.1902	+71 - 5	
η	Virginis	4.0	+1.27	-7.1	- 0	14.5	15	57.9	+ 9 39.1	+0.3188	0.5647	-0.1903	+54 -17	
γ	Virginis (<i>mean</i>)	2.9	1.39	6.3	1	1.7	22	1 43.2	- 4 55.7	-0.7386	0.5667	0.1901	- 6 -90	
38	Virginis	6.1	1.50	6.5	3	8.2	6	49.9	+ 0 0.3	+0.4224	0.5680	0.1892	+61 -12	
91 G.	Virginis	6.5	1.52	6.7	3	48.4	7	1.1	+ 0 11.2	+1.0645	0.5680	0.1892	+87 +28	
	SATURN	1.0	...	...	2	55.7	8	35.8	+ 1 42.6	-0.1215	0.5683	0.1886	+28 -42
<i>k</i>	Virginis	5.7	+1.54	-6.3	- 3	23.9	9	41.5	+ 2 46.0	+0.1464	0.5688	-0.1886	+43 -27	
46	Virginis	6.1	1.54	6.1	2	57.4	10	6.5	+ 3 10.1	-0.3786	0.5689	0.1885	+14 -58	
48	Virginis	6.5	1.56	6.0	3	15.0	11	34.3	+ 4 34.8	-0.3569	0.5693	0.1881	+15 -57	
θ	Virginis	4.4	1.62	6.4	5	7.8	14	13.9	+ 7 8.8	+1.0389	0.5701	0.1872	+85 +26	
65	Virginis	6.0	1.69	5.5	4	31.4	20	6.4	-11 11.1	-0.6655	0.5719	0.1848	- ? -84	
66	Virginis	5.7	+1.71	-5.5	- 4	45.8	20	38.5	-10 40.1	-0.5226	0.5721	-0.1846	+ 5 -69	
72	Virginis	6.1	1.75	5.6	6	4.5	23	12.4	- 8 11.6	+0.3249	0.5730	0.1833	+53 -17	
<i>l</i>	Virginis	4.8	1.76	5.4	5	51.6	23	53.0	- 7 32.5	-0.0149	0.5732	0.1829	+33 -36	
80	Virginis	5.6	1.76	4.9	5	0.3	23	1 26.0	- 6 2.8	-1.1568	0.5737	0.1821	-38 -90	
88	Virginis	6.5	1.85	4.7	6	27.3	6	58.3	- 0 42.4	-0.6987	0.5757	0.1787	- 6 -89	
598 B.	Virginis	6.1	+1.91	-4.7	- 7	40.9	9	50.9	+ 2 4.0	+0.0220	0.5768	-0.1766	+34 -34	
623 B.	Virginis	6.5	1.98	4.5	8	53.4	13	52.2	+ 5 56.7	+0.5290	0.5783	0.1736	+67 - 6	
95	Virginis	5.4	1.99	4.4	8	56.9	14	52.9	+ 6 55.1	+0.4123	0.5788	0.1727	+58 -12	
96	Virginis	6.5	2.02	4.6	9	58.3	15	51.1	+ 7 51.3	+1.2716	0.5791	0.1719	+81 +52	
κ	Virginis	4.3	2.04	4.2	9	55.0	17	30.6	+ 9 27.2	+0.9327	0.5797	0.1705	+81 +19	
6 B.	Libræ	6.2	+2.17	-3.2	-11	58.8	24	3 44.1	- 4 41.7	+1.3036	0.5839	-0.1604	+77 +60	
22 B.	Libræ	6.4	2.26	2.8	12	31.0	8	16.6	- 0 19.2	+1.1247	0.5858	0.1552	+78 +35	
13	Libræ	5.7	2.27	2.1	11	35.1	10	59.2	+ 2 17.3	-0.2238	0.5869	0.1520	+18 -48	
ξ^2	Libræ	5.6	2.27	1.8	11	6.0	11	58.9	+ 3 14.8	-0.8599	0.5873	0.1507	-19 -90	
17	Libræ	6.4	2.27	1.7	10	50.8	12	35.4	+ 3 49.9	-1.2048	0.5876	0.1500	-48 -90	
18	Libræ	5.9	+2.27	-1.7	-10	50.2	12	52.4	+ 4 6.2	-1.2579	0.5877	-0.1496	-55 -90	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.				
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.		
			$\Delta\alpha$	$\Delta\delta$												
			s	"	°	'	d	h	m	h	m			°	'	
γ	Libræ	4.0	+2.50	0.0	14	32.0	25	3	54.5	5	25.8	+0.3437	0.5936	-0.1284	+48	-16
190 B.	Libræ	6.5	2.53+	0.4	14	47.8		7	7.1	2	20.4	+0.2029	0.5947	0.1234	+39	-23
η	Libræ	5.5	2.54	0.3	15	25.7		7	22.9	-2	5.3	+0.8018	0.5948	0.1230	+75	+11
195 B.	Libræ	6.2	2.54	1.2	13	54.1		10	27.9+	0	52.6	-1.0966	0.5959	0.1180	-40	-90
202 B.	Libræ	6.4	2.56	1.4	14	10.4		12	19.2+	2	39.6	-1.0406	0.5965	0.1149	-36	-90
203 B.	Libræ	6.2	+2.57+	1.4	14	36.3		12	26.6+	2	46.7	-0.6240	0.5965	-0.1147	-8	-81
48	Libræ	4.6	2.56	1.6	14	3.5		13	6.7+	3	25.4	-1.2469	0.5967	0.1135	-58	-90
49	Libræ	5.4	2.59	1.2	16	18.4		13	58.3+	4	15.0	+0.9056	0.5970	0.1121	+74	+18
ϕ	Ophiuchi	4.4	2.70	3.5	16	26.7	26	2	18.5	-7	53.6	-0.2044	0.6004	0.0899	+12	-47
24	Scorpii	5.0	2.74	4.1	17	35.6		6	27.2	-3	54.6	+0.5898	0.6013	0.0820	+62	-1
78 B.	Ophiuchi	6.5	+2.76+	5.2	-16	41.0		12	12.6+	1	37.3	-0.7622	0.6022	-0.0707	-21	-90
90 B.	Ophiuchi	6.5	2.79	5.2	18	7.7		13	39.9+	3	1.1	+0.5867	0.6024	0.0678	+60	-2
29	Ophiuchi	6.4	2.81	5.4	18	46.3		14	29.9+	3	49.2	+1.1768	0.6025	0.0662	+72	+44
125 B.	Ophiuchi	6.2	2.79	6.0	17	30.4		17	2.9+	6	16.2	-0.2553	0.6028	0.0610	+7	-51
164 B.	Ophiuchi	6.0	2.81	6.8	17	40.5		21	39.6+	10	42.0	-0.3462	0.6031	0.0516	+1	-57
192 B.	Ophiuchi	6.3	+2.83+	7.0	-18	22.4		23	31.4	-11	30.6	+0.2634	0.6031	-0.0477	+35	-20
305 B.	Ophiuchi	6.3	2.85	9.1	18	47.2	27	11	55.6+	0	24.5	+0.2495	0.6025	0.0218	+32	-21
39 G.	Sagittarii	6.3	2.86	10.0	19	51.3		18	0.5+	6	15.1	+1.2373	0.6016	0.0090	+71	+54
64 B.	Sagittarii	6.1	2.84	10.4	18	41.0		19	43.5+	7	54.0	+0.0392	0.6013	0.0054	+18	-33
6 B.	Scuti	5.9	2.82	10.5	17	23.9		20	24.8+	8	33.7	-1.2654	0.6012	0.0039	-71	-80
52 G.	Sagittarii	6.4	+2.84+	10.5	-18	29.4		20	30.8+	8	39.5	-0.1608	0.6011	-0.0037	+7	-45
17 H.	Sagittarii	6.4	2.84	10.6	18	38.8		21	0.4+	9	7.9	-0.0024	0.6010	0.0027	+16	-35
Y	Sagittarii (var.)	5.4	2.84	10.7	18	53.5		22	4.0+	10	9.0	+0.2441	0.6008	0.0005	+30	-21
85 B.	Sagittarii	6.0	2.82	11.1	17	50.7	28	0	42.3	-11	18.9	-0.8120	0.6001	+0.0050	-30	-90
95 B.	Sagittarii	5.7	2.83	11.2	18	46.5		1	35.7	-10	27.5	+0.1370	0.5999	0.0069	+24	-27
100 B.	Sagittarii	5.0	+2.82	+11.3	-18	27.2		2	5.9	-9	58.6	-0.1860	0.5998	+0.0079	+6	-46
171 B.	Sagittarii	6.1	2.80	13.1	19	21.3		14	51.3+	2	17.3	+1.0015	0.5954	0.0339	+71	+27
173 B.	Sagittarii	6.4	2.80	13.1	19	12.7		14	52.7+	2	18.7	+0.8561	0.5954	0.0340	+71	+16
187 B.	Sagittarii	6.4	2.78	13.3	18	51.3		16	31.4+	3	53.6	+0.5505	0.5947	0.0372	+55	-4
190 B.	Sagittarii	5.4	2.79	13.4	19	24.5		16	58.8+	4	20.0	+1.1338	0.5946	0.0381	+71	+39
d	Sagittarii	5.0	+2.76	+13.8	-19	5.2		20	48.8+	8	1.2	+0.9680	0.5929	+0.0456	+71	+24
ρ	Sagittarii	4.0	2.74	14.0	17	59.4		22	29.3+	9	37.9	-0.0767	0.5921	0.0488	+16	-39
45	Sagittarii	6.0	2.75	14.0	18	26.9		22	33.0+	9	41.5	+0.3962	0.5921	0.0490	+44	-12
267 B.	Sagittarii	5.8	2.70	14.7	18	23.9	29	4	50.7	-8	14.9	+0.6932	0.5890	0.0608	+70	+5
54	Sagittarii	5.4	2.67	14.7	16	28.0		6	23.6	-6	45.6	-1.1971	0.5882	0.0636	-56	-90
31 B.	Capricorni	6.4	+2.52	+16.3	-15	59.6	30	2	48.8	-11	5.0	-0.0346	0.5762	+0.0980	+23	-37
27 G.	Capricorni	6.2	2.50	16.2	15	18.6		3	50.4	-10	5.7	-0.6428	0.5756	0.0996	-11	-84
47 B.	Capricorni	6.2	2.50	16.6	16	47.2		5	46.1	-8	14.1	+1.0891	0.5744	0.1025	+74	+33
τ	Capricorni	5.2	2.47	16.4	15	13.3		7	25.4	-6	38.3	-0.3705	0.5733	0.1049	+5	-58
61 B.	Capricorni	5.9	2.47	16.7	16	23.7		7	58.2	-6	6.7	+0.9106	0.5730	0.1057	+74	+19
95 B.	Capricorni	5.9	+2.39	+16.7	-14	46.6		16	1.8+	1	40.0	+0.1195	0.5677	+0.1169	+34	-28
53 B.	Aquarii	6.5	+2.31	+16.7	-13	31.1		23	50.2+	9	12.4	-0.2512	0.5626	+0.1267	+14	-50

JULY.

18 Aquarii	5.5	+2.28	+16.7	-13 12.3	1	3	34.8	-11 10.5	-0.0984	0.5602	+0.1311	+23	-41
72 B. Aquarii	6.5	2.25	16.5	11 53.9		5	27.0	-9 22.1	-1.2311	0.5590	0.1332	-52	-90
λ Capricorni	5.5	2.17	16.5	11 43.0		13	57.8	-1 8.2	-0.2536	0.5536	0.1421	+16	-50
56 B. Aquarii	6.5	2.14	16.2	10 40.2		17	18.0	+2 5.3	-0.8870	0.5515	0.1452	-20	-90
150 B. Aquarii	6.0	2.03	15.8	9 25.2	2	4	26.6	-11 7.5	-0.5527	0.5449	0.1545	+1	-72
167 G. Aquarii	6.3	+1.93	+15.2	-8 17.6		14	56.9	-0 57.1	-0.1003	0.5392	+0.1616	+27	-41

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	° ' "	d h m	h m				° ' "	° ' "		
213 B. Aquarii	6.5	+1.90	+15.3	- 8 42.6	2 17 16.2	+ 1 17.9	+0.7251	0.5380	+0.1629	+82	+ 6		
67 Aquarii	6.4	1.91	14.8	7 21.7	17 22.0	+ 1 23.6	-0.7104	0.5379	0.1630	-7	- 90		
λ Aquarii	3.8	1.86	14.9	7 59.1	22 1.9	+ 5 54.9	+0.7279	0.5356	0.1655	+83	+ 6		
78 Aquarii	6.3	1.85	14.7	7 36.6	23 0.8	+ 6 52.0	+0.4855	0.5351	0.1660	+64	- 8		
81 Aquarii	6.4	1.81	14.5	7 28.3	3 2 26.5	+10 11.4	+0.9080	0.5336	0.1676	+83	+17		
82 Aquarii	6.4	+1.81	+14.3	- 6 59.0	3 1.4	+10 45.2	+0.4790	0.5333	+0.1678	+64	- 9		
ϕ Aquarii	4.4	1.76	13.8	6 27.6	8 59.3	-7 27.7	+0.9224	0.5307	0.1702	+84	+18		
URANUS	6.1	...	...	5 39.8	11 29.5	- 5 2.0	+0.4857	0.5302	0.1712	+65	-18
96 Aquarii	5.7	1.74	13.5	5 32.5	11 34.3	- 4 57.3	+0.3666	0.5297	0.1710	+56	-15		
316 B. Aquarii	6.5	1.75	13.0	4 20.1	12 0.8	- 4 31.6	-0.8677	0.5295	0.1712	-15	-90		
317 B. Aquarii	6.3	+1.72	+13.7	- 6 19.5	12 14.2	- 4 18.6	+1.3316	0.5295	+0.1713	+77	+65		
337 B. Aquarii	6.4	1.69	12.9	4 56.9	16 46.0	+ 0 5.2	+0.6162	0.5278	0.1726	+77	- 1		
342 B. Aquarii	6.5	1.68	12.7	4 30.3	17 47.6	+ 1 4.8	+0.3104	0.5274	0 1729	+53	-18		
20 Piscium	5.6	1.61	11.8	3 11.2	4 2 17.6	+ 9 19.9	+0.3512	0.5247	0.1745	+56	-16		
24 Piscium	6.1	1.58	11.8	3 34.8	4 53.3	+11 51.0	+1.2350	0.5240	0.1749	+87	+45		
80 B. Piscium	6.3	+1.54	+10.4	- 0 55.7	11 14.2	- 5 59.3	-0.5551	0.5224	+0.1754	+ 4	-72		
10 Ceti	6.4	1.43	9.4	0 28.4	22 34.8	+ 5 1.7	+0.9361	0.5204	0.1752	+90	+19		
155 B. Piscium	6.5	1.35	7.1	2 58.2	5 11 38.3	- 6 17.4	-0.5765	0.5192	0.1732	+3	-74		
77 Piscium	6.4	1.29	5.9	4 30.0	19 19.8	+ 1 10.9	-0.9419	0.5190	0.1712	-19	-86		
μ Piscium	5.0	1.20	4.4	5 44.9	6 8 13.2	-10 18.0	-0.1434	0.5198	0.1665	+27	-42		
39 B. Arietis	6.5	+1.03	+ 2.2	+ 7 22.0	7 2 27.8	+ 7 25.2	+1.0236	0.5228	+0.1570	+90	+28		
64 Ceti	5.8	1.01	1.6	8 12.6	5 51.7	+10 43.1	+0.6204	0.5236	0.1549	+79	+ 2		
ξ^1 Ceti	4.5	1.01	1.5	8 29.2	6 42.8	+11 32.7	+0.4467	0.5237	0.1543	+63	- 8		
ξ Arietis	5.5	0.97	0.3	10 15.8	12 50.2	- 6 30.7	-0.5857	0.5254	0.1501	+ 2	70		
25 Arietis	6.5	0.95	0.2	9 51.4	14 11.2	- 5 12.1	+0.0644	0.5257	0.1490	+38	-28		
389 B. Ceti	6.3	+0.94	+ 0.5	+ 9 13.4	15 19.0	- 4 6.3	+0.9342	0.5261	+0.1483	+90	+22		
85 Ceti	6.3	0.89	- 0.5	10 24.9	21 56.7	+2 19.7	+0.5822	0.5281	0.1430	+75	+ 1		
38 Arietis	5.2	0.91	1.2	12 7.3	23 11.5	+ 3 32.2	-1.1276	0.5285	0.1420	-35	-78		
147 B. Arietis	5.8	0.81	2.4	12 53.4	8 10 5.6	- 9 53.2	-0.4785	0.5324	0.1322	+ 8	-59		
8 B. Tauri	6.2	0.72	3.0	12 21.4	19 1.4	- 1 13.7	+1.2503	0.5359	0.1233	+90	+56		
30 B. Tauri	6.4	+0.70	- 4.3	+15 10.7	9 1 45.3	+ 5 17.7	-1.0485	0.5387	+0.1160	-29	-75		
179 B. Tauri	5.9	0.58	5.3	14 57.4	16 21.8	- 4 33.2	+0.7630	0.5450	0.0983	+90	+17		
48 Tauri	6.3	0.54	5.7	15 12.5	20 15.0	- 0 47.5	+0.8590	0.5468	0.0932	+90	+24		
γ Tauri	3.9	0.53	5.9	15 26.5	22 10.5	+ 1 4.3	+0.7801	0.5477	0.0907	+90	+19		
δ Tauri	3.9	0.54	6.4	17 21.7	23 39.1	+ 2 30.1	-1.1861	0.5483	0.0887	-44	-73		
63 Tauri	5.7	+0.53	- 6.2	+16 35.8	23 53.6	+ 2 44.1	-0.3295	0.5484	+0.0883	+16	-44		
64 Tauri	4.9	0.53	6.4	17 15.9	10 0 12.4	+ 3 2.3	-1.0315	0.5486	0.0879	-28	-73		
70 Tauri	6.4	0.51	6.1	15 45.9	0 57.4	+ 3 45.9	+0.6731	0.5489	0.0869	+88	+13		
71 Tauri	4.6	0.50	6.1	15 26.6	1 18.3	+ 4 6.0	+1.0543	0.5490	0.0864	+90	+39		
75 Tauri	5.2	0.50	6.3	16 11.2	2 17.8	+ 5 3.7	+0.3269	0.5495	0.0857	+55	- 6		
θ^1 Tauri	4.2	+0.50	- 6.2	+15 47.4	2 21.8	+ 5 7.4	+0.7649	0.5495	+0.0850	+90	+19		
θ^2 Tauri	3.6	0.50	6.2	15 42.0	2 24.3	+ 5 9.9	+0.8681	0.5495	0.0849	+90	+26		
80 Tauri	5.8	0.49	6.2	15 28.2	3 6.8	+ 5 51.0	+1.1789	0.5499	0.0839	+90	+51		
264 B. Tauri	4.8	0.49	6.3	16 1.6	3 18.2	+ 6 2.0	+0.5874	0.5500	0.0836	+77	+ 9		
81 Tauri	5.5	0.49	6.2	15 31.4	3 21.1	+ 6 5.0	+1.1395	0.5499	0.0836	+90	+47		
85 Tauri	6.0	+0.48	- 6.3	+15 41.2	3 55.6	+ 6 38.2	+1.0102	0.5502	+0.0827	+90	+36		
275 B. Tauri	6.5	0.48	6.4	16 9.7	4 45.9	+ 7 27.0	+0.5603	0.5506	0.0816	+75	+ 7		
α Tauri (<i>Aldebar.</i>)	1.1	0.47	6.7	16 21.2	5 50.5	+ 8 29.5	+0.4370	0.5511	0.0800	+64	0		
89 Tauri	5.8	0.46	6.5	15 52.7	6 54.4	+ 9 31.2	+1.0394	0.5516	0.0785	+90	+39		
σ^2 Tauri	4.9	0.46	6.5	15 45.9	7 26.2	+10 2.0	+1.2045	0.5518	0.0778	+90	+55		
318 B. Tauri	5.7	+0.40	- 7.3	17 1.9	15 54.8	- 5 46.0	+0.4293	0.5555	+0.0652	+63	+ 2		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S						AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.		Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
			$\Delta\alpha$	$\Delta\delta$		d	h	m						
<i>m</i>	Tauri	5.0	+0.40	-7.8	+18 32.5	10	20	33.1	- 1 16.9	-0.9223	0.5575	+0.0581	-20	-72
111	Tauri	5.1	0.32	8.0	17 18.7	11	4	21.1	+ 6 18.4	+0.8168	0.5606	0.0455	+90	+26
115	Tauri	5.3	0.31	8.1	17 53.7		5	39.6	+ 7 31.3	+0.2410	0.5611	0.0435	+50	- 7
117	Tauri	6.0	0.30	8.1	17 10.4		6	3.7	+ 7 54.6	+1.0381	0.5613	0.0428	+90	+42
119	Tauri	4.9	0.30	8.3	18 32.2		7	57.3	+ 9 44.4	-0.3558	0.5620	0.0397	+15	-41
120	Tauri	5.6	+0.29	-8.4	+18 29.1		8	33.3	+10 19.2	-0.2765	0.5622	+0.0387	+15	-35
NEW MOON.														
18	Leonis	5.8	+0.23	-7.3	+12 9.8	16	0	16.9	- 1 52.1	-0.1249	0.5706	-0.1455	+28	37
19	Leonis	6.4	0.24	7.4	11 55.4		0	44.8	- 1 25.3	+0.0555	0.5705	0.1460	+38	-27
<i>R</i>	Leonis (<i>var.</i>)	4.6	+0.24	-7.4	+11 47.1		0	48.1	- 1 22.0	+0.1902	0.5705	-0.1461	+46	-19
<i>A</i>	Leonis	4.6	0.30	7.1	10 22.4		9	51.2	+ 7 22.2	+0.2751	0.5691	0.1563	+52	-16
44	Leonis	5.9	0.37	6.8	9 10.5		17	35.6	- 9 9.5	+0.2668	0.5679	0.1642	+51	-17
45	Leonis	5.8	0.37	6.5	10 9.2		18	39.5	- 8 7.8	-0.9140	0.5678	0.1651	-18	-80
ρ	Leonis	3.8	0.39	6.4	9 42.1		20	58.2	- 5 54.0	-0.8331	0.5675	0.1671	-12	-81
49	Leonis	5.7	+0.40	-6.5	+ 9 2.8		21	58.2	- 4 56.0	-0.3286	0.5673	-0.1681	+17	-52
37	Sextantis	6.3	0.47	6.8	6 46.6	17	2	56.0	- 0 8.5	+1.1542	0.5667	0.1722	+90	+39
56	Leonis	6.1	0.51	6.5	6 35.7		7	23.4	+ 4 9.7	+0.5655	0.5661	0.1755	+73	- 2
<i>c</i>	Leonis	5.1	0.53	6.3	6 30.8		9	30.7	+ 6 12.6	+0.2745	0.5659	0.1769	+51	-18
χ	Leonis	4.7	0.52	5.8	7 45.1		11	26.2	+ 8 4.1	-1.3334	0.5657	0.1782	-69	-73
σ	Leonis	4.1	+0.62	-5.6	+ 6 27.0		18	41.2	- 8 55.8	-1.3093	0.5651	-0.1825	-57	-83
80	Leonis	6.4	0.66	6.0	4 17.0		20	48.4	- 6 53.0	+0.5160	0.5649	0.1835	+69	- 6
83	Leonis	6.3	0.65	6.1	3 25.9		21	14.8	- 6 27.5	+1.3037	0.5649	0.1837	+87	+57
89	Leonis	5.7	0.70	6.0	3 29.2	18	0	39.3	- 3 9.9	+0.6182	0.5648	0.1852	+78	0
β	Virginis	3.8	0.83	5.8	2 11.8		7	58.9	+ 3 54.6	+0.5647	0.5645	0.1878	+73	- 4
27 B.	Virginis	6.5	+0.86	-5.7	+ 0 57.4		11	46.9	+ 7 34.8	+1.1109	0.5644	-0.1887	+90	+32
10	Virginis	6.2	0.90	4.9	+ 2 19.7		16	31.0	-11 47.9	-1.1897	0.5645	0.1895	-40	-88
13	Virginis	5.9	0.98	5.3	- 0 21.6		20	36.6	- 7 53.6	+0.7776	0.5646	0.1899	+90	+ 9
η	Virginis	4.0	0.98	5.2	0 14.4		21	10.1	- 7 21.3	+0.5492	0.5647	0.1900	+72	- 5
γ	Virginis (<i>mean</i>)	2.9	1.09	4.5	1 1.7	19	6	57.6	+ 2 5.9	0.5099	0.5655	0.1895	+ 7	-68
38	Virginis	6.1	+1.19	-4.7	- 3 8.2		12	6.3	+ 7 4.0	+0.6550	0.5661	-0.1887	+82	+ 1
91 G.	Virginis	6.5	1.20	4.9	3 48.1		12	17.6	+ 7 14.9	+1.2998	0.5661	0.1886	+86	+55
<i>k</i>	Virginis	5.7	1.24	4.4	3 23.9		14	59.3	+ 9 51.1	+0.3776	0.5664	0.1878	+58	-14
	SATURN	1.1	...	...	3 22.2		15	14.8	+10 6.0	+0.3004	0.5646	0.1868	+53	-18
46	Virginis	6.1	1.24	4.2	2 57.4		15	24.6	+10 15.4	-0.1497	0.5665	0.1878	+26	-44
48	Virginis	6.5	+1.26	-4.2	- 3 15.0		16	53.1	+11 40.9	-0.1282	0.5667	-0.1874	+27	-42
θ	Virginis	4.4	1.32	4.6	5 7.8		19	34.3	- 9 43.5	+1.2740	0.5673	0.1865	+85	+50
65	Virginis	6.0	1.38	3.6	4 31.4	20	1	30.9	- 3 59.3	-0.4417	0.5682	0.1840	+10	-63
66	Virginis	5.7	1.40	3.7	4 45.8		2	3.4	- 3 27.8	-0.2984	0.5683	0.1837	+18	-53
72	Virginis	6.1	1.45	3.8	6 4.5		4	39.5	- 0 57.1	+0.5533	0.5689	0.1824	+70	- 4
<i>l</i>	Virginis	4.8	+1.45	-3.7	- 5 51.6		5	20.6	- 0 17.5	+0.2110	0.5690	-0.1820	+46	-23
80	Virginis	5.6	1.46	3.1	5 0.3		6	55.0	+ 1 13.6	-0.9394	0.5694	0.1811	-20	-90
88	Virginis	6.5	1.56	3.0	6 27.3		12	32.5	+ 6 39.3	-0.4820	0.5707	0.1776	+ 7	-66
598 B.	Virginis	6.1	1.61	3.1	7 40.9		15	28.1	+ 9 28.6	+0.2422	0.5715	0.1756	+47	-22
623 B.	Virginis	6.5	1.69	3.0	8 53.3		19	33.9	-10 34.2	+0.7504	0.5725	0.1725	+82	+ 7
95	Virginis	5.4	+1.70	-2.8	- 8 56.8		20	35.8	- 9 34.5	+0.6320	0.5728	-0.1717	+75	0
κ	Virginis	4.3	1.75	2.8	9 55.0		23	16.6	- 6 59.4	+1.1549	0.5736	0.1693	+81	+37
13	Librae	5.7	2.02	0.9	11 35.1	21	17	9.0	+10 14.6	-0.0306	0.5791	0.1510	+28	-37
ξ^2	Librae	5.6	2.02	0.5	11 6.0		18	10.3	+11 13.6	-0.6748	0.5795	0.1498	- 7	-86
17	Librae	6.4	2.03	0.4	10 50.8		18	47.7	+11 49.6	-1.0243	0.5797	0.1490	-31	-90
18	Librae	5.9	+2.03	-0.4	-10 50.1		19	5.1	-11 53.7	-1.0783	0.5798	-0.1487	-35	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m						
		s	"	° ' "	d	h	m	h	m				
130 B. Libræ	5.9	+2.19	+ 0.8	-12 5.7	22	5	39.2	- 1 42.7	-1.3053	0.5832	-0.1349	-70	-75
γ Libræ	4.0	2.29	0.8	14 32.0		10	31.3	+ 2 58.6	+0.5204	0.5848	0.1279	+61	- 6
190 B. Libræ	6.5	2.34	1.2	14 47.8		13	49.3	+ 6 9.4	+0.3732	0.5859	0.1229	+50	-14
η Libræ	5.5	2.35	1.1	15 25.7		14	5.5	+ 6 24.9	+0.9788	0.5860	0.1226	+75	+23
195 B. Libræ	6.2	2.36	2.2	13 54.1		17	15.8	+ 9 28.1	-0.9472	0.5869	0.1177	-28	-90
202 B. Libræ	6.4	+2.39	+ 2.3	-14 10.4		19	10.2	+11 18.2	-0.8936	0.5875	-0.1147	-25	-90
203 B. Libræ	6.2	2.40	2.2	14 36.2		19	17.7	+11 25.5	-0.4721	0.5875	0.1144	0	-66
48 Libræ	4.6	2.40	2.5	14 3.5		19	59.0	-11 54.7	-1.1037	0.5878	0.1133	-41	-90
49 Libræ	5.4	2.43	1.8	16 18.4		20	52.1	-11 3.6	+1.0739	0.5881	0.1119	+74	+32
91 B. Scorpïi	6.1	2.49	3.6	14 39.4	23	3	17.3	+ 4 53.0	-1.2822	0.5898	0.1012	-67	-80
ϕ Ophiuchi	4.4	+2.59	+ 4.1	-16 26.7		9	33.4	+ 1 9.0	-0.0706	0.5914	-0.0902	+20	-39
24 Scorpïi	5.0	2.65	4.5	17 35.6		13	49.1	+ 5 15.0	+0.7260	0.5923	0.0825	+73	+ 7
78 B. Ophiuchi	6.5	2.70	5.8	16 41.0		19	41.1	+10 56.5	-0.6528	0.5935	0.0714	-14	-85
90 B. Ophiuchi	6.5	2.73	5.6	18 7.7		21	13.9	-11 37.1	+0.7097	0.5937	0.0686	+71	+ 6
125 B. Ophiuchi	6.2	2.75	6.4	17 30.4	24	0	42.4	+ 8 16.6	-0.1486	0.5943	0.0619	+13	-44
164 B. Ophiuchi	6.0	+2.80	+ 7.2	-17 40.5		5	26.4	+ 3 43.5	-0.2492	0.5948	-0.0527	+ 7	-50
192 B. Ophiuchi	6.3	2.83	7.4	18 22.4		7	21.2	+ 1 53.1	+0.3639	0.5949	0.0489	+42	-14
305 B. Ophiuchi	6.3	2.92	9.4	18 47.2		20	3.8	+10 20.4	+0.3258	0.5953	0.0235	+37	-16
64 B. Sagittarii	6.1	2.95	10.8	18 41.0	25	4	2.2	+ 5 59.4	+0.0978	0.5948	0.0073	+22	-29
6 B. Scuti	5.9	2.93	11.1	17 23.9		4	44.3	+ 5 19.0	-1.2210	0.5947	0.0058	-64	-90
52 G. Sagittarii	6.4	+2.95	+10.9	-18 29.4		4	50.4	+ 5 13.1	-0.1057	0.5947	-0.0056	+10	-41
17 H ¹ Sagittarii	6.4	2.96	11.0	18 38.8		5	20.6	+ 4 44.0	+0.0533	0.5947	0.0046	+19	-32
Υ Sagittarii (<i>var.</i>)	5.4	2.97	11.2	18 53.5		6	25.6	+ 3 41.5	+0.3001	0.5945	-0.0025	+33	-18
85 B. Sagittarii	6.0	2.96	11.7	17 50.7		9	7.0	+ 1 6.3	-0.7713	0.5941	+0.0030	-28	-90
95 B. Sagittarii	5.7	2.98	11.7	18 46.5		10	1.6	+ 0 13.8	+0.1849	0.5940	0.0048	+27	-24
100 B. Sagittarii	5.0	+2.97	+11.8	-18 27.2		10	32.3	+ 0 15.7	-0.1420	0.5939	+0.0059	+ 8	-43
171 B. Sagittarii	6.1	3.02	13.6	19 21.3		23	31.1	-11 14.9	+1.0295	0.5911	0.0317	+71	+29
173 B. Sagittarii	6.4	3.02	13.7	19 12.7		23	32.6	-11 13.4	+0.8830	0.5911	0.0317	+71	+18
187 B. Sagittarii	6.4	3.02	13.9	18 51.3	26	1	12.7	+ 9 37.2	+0.5716	0.5906	0.0350	+56	- 2
190 B. Sagittarii	5.4	3.02	13.9	19 24.5		1	40.5	+ 9 10.4	+1.1583	0.5904	0.0359	+71	+42
<i>d</i> Sagittarii	5.0	+3.02	+14.5	-19 5.2		5	33.8	+ 5 25.9	+0.9832	0.5892	+0.0434	+71	+25
ρ Sagittarii	4.0	3.00	14.8	17 59.4		7	15.6	+ 3 47.9	-0.0722	0.5886	0.0466	+16	-39
45 Sagittarii	6.0	3.01	14.8	18 26.9		7	19.3	+ 3 44.3	+0.4037	0.5886	0.0467	+44	-12
267 B. Sagittarii	5.8	3.01	15.6	18 23.9		13	41.5	+ 2 23.7	+0.6898	0.5862	0.0586	+69	+ 5
54 Sagittarii	5.4	2.98	15.9	16 28.0		15	15.4	+ 3 54.1	-1.2149	0.5856	0.0614	-59	-90
31 B. Capricorni	6.4	+2.94	+18.0	-15 59.5	27	11	48.8	+ 0 17.1	-0.0854	0.5761	+0.0961	+20	-40
27 G. Capricorni	6.2	2.92	18.0	15 18.6		12	50.6	+ 0 42.6	-0.6974	0.5757	0.0977	-14	-90
47 B. Capricorni	6.2	2.94	18.2	16 47.2		14	46.6	+ 2 34.4	+1.0359	0.5745	0.1007	+74	+29
τ Capricorni	5.2	2.91	18.3	15 13.2		16	26.1	+ 4 10.4	-0.4309	0.5737	0.1031	+ 2	-63
61 B. Capricorni	5.9	2.92	18.4	16 23.6		16	59.0	+ 4 42.1	+0.8525	0.5733	0.1040	+74	+15
95 B. Capricorni	5.9	+2.87	+18.8	-14 46.6	28	1	2.7	-11 31.1	+0.0442	0.5689	+0.1153	+29	-32
53 B. Aquarii	6.5	2.83	19.2	13 31.0		8	50.2	+ 3 59.6	-0.3411	0.5646	0.1255	+ 9	-56
18 Aquarii	5.5	2.81	19.3	13 12.2		12	34.1	+ 0 23.3	-0.1946	0.5625	0.1300	+18	-46
λ Capricorni	5.5	2.74	19.5	11 43.0		22	53.7	+ 9 35.6	-0.3675	0.5566	0.1414	+10	-58
151 B. Capricorni	6.1	2.74	19.7	13 4.6	29	0	21.3	+11 0.3	+1.2833	0.5558	0.1428	+77	+56
96 B. Aquarii	6.5	+2.72	+19.4	-10 40.2		2	12.5	-11 12.1	-1.0056	0.5547	+0.1445	-29	-90
150 B. Aquarii	6.0	2.65	19.3	9 25.1		13	15.6	+ 0 30.6	-0.6887	0.5487	0.1542	- 7	-88
167 G. Aquarii	6.3	2.58	19.0	8 17.6		23	39.6	+ 9 33.6	-0.2523	0.5433	0.1615	+19	-50
213 B. Aquarii	6.5	2.56	19.0	8 42.6	30	1	57.4	+11 47.0	+0.5678	0.5422	0.1630	+70	- 4
67 Aquarii	6.4	2.57	18.8	7 21.7		2	3.1	+11 52.5	-0.8641	0.5422	0.1630	-17	-90
λ Aquarii	3.8	+2.53	+18.8	- 7 59.1		6	40.0	+ 7 39.1	+0.5641	0.5399	+0.1657	+70	- 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
78 Aquarii	6.3	+2.53	+18.6	7 36.5	30 7 38.2	- 6 42.8	+0.3211	0.5395	+0.1662	+52	-17
81 Aquarii	6.4	2.50	18.5	7 28.2	11 1.5	- 3 25.7	+0.7380	0.5379	0.1678	+83	+ 6
82 Aquarii	6.4	2.50	18.4	6 59.0	11 36.0	- 2 52.3	+0.3095	0.5377	0.1681	+52	-18
ϕ Aquarii	4.4	2.46	18.0	6 27.6	17 29.7	+ 2 50.6	+0.7445	0.5352	0.1706	+84	+ 7
URANUS	6.1	...	...	5 52.5	19 1.8	+ 4 19.9	+0.3750	0.5358	0.1717	+57	-14
96 Aquarii	5.7	+2.45	+17.8	5 32.4	20 2.9	+ 5 19.2	+0.1877	0.5341	+0.1715	+45	-24
316 B. Aquarii	6.5	2.46	17.4	4 20.0	20 29.1	+ 5 44.6	-1.0431	0.5339	0.1716	-28	-90
317 B. Aquarii	6.3	2.43	17.9	6 19.4	20 42.4	+ 5 57.5	+1.1487	0.5338	0.1717	+84	+36
337 B. Aquarii	6.4	2.41	17.3	4 56.8	31 1 11.0	+10 17.9	+0.4309	0.5321	0.1731	+61	-11
342 B. Aquarii	6.5	2.41	17.2	4 30.2	2 11.8	+11 16.9	+0.1250	0.5318	0.1734	+41	-28
20 Piscium	5.6	+2.35	+16.5	3 11.1	10 35.9	- 4 34.1	+0.1576	0.5288	+0.1751	+44	-26
24 Piscium	6.1	2.33	16.4	3 34.7	13 9.8	- 2 4.7	+1.0362	0.5281	0.1755	+87	+26
80 B. Piscium	6.3	+2.30	+15.3	0 55.6	19 26.4	+ 4 0.7	-0.7526	0.5263	+0.1760	- 7	-90

AUGUST.

10 Ceti	6.4	+2.21	+14.4	0 28.3	1 6 40.1	- 9 5.2	+0.7265	0.5237	+0.1758	+90	+ 6
155 B. Piscium	6.5	2.14	12.2	+ 2 58.2	19 36.8	+ 3 28.9	-0.7873	0.5218	0.1738	- 9	-88
77 Piscium	6.4	2.10	11.0	4 30.1	2 3 15.1	+10 53.9	-1.1540	0.5212	0.1717	-36	-86
μ Piscium	5.0	2.01	9.4	5 45.0	16 4.6	- 0 38.8	-0.3588	0.5211	0.1669	+15	-56
39 B. Arietis	6.5	+1.86	+ 7.0	+ 7 22.1	3 10 17.2	- 6 57.7	+0.8102	0.5227	+0.1572	+90	+13
64 Ceti	5.8	1.83	6.3	8 12.7	13 41.0	- 3 39.9	+0.4084	0.5232	0.1550	+60	-10
ξ^1 Ceti	4.5	1.83	6.2	8 29.3	14 32.2	- 2 50.1	+0.2351	0.5234	0.1545	+49	-19
ξ Arietis	5.5	1.80	4.9	10 15.8	20 40.2	+ 3 7.1	-0.7948	0.5246	0.1502	-10	-80
25 Arietis	6.5	1.77	4.8	9 51.5	22 1.3	+ 4 25.8	-0.1441	0.5248	0.1492	+27	-40
389 B. Ceti	6.3	+1.76	+ 5.0	+ 9 13.4	23 9.3	+ 5 31.8	+0.7263	0.5251	+0.1483	+90	+ 9
85 Ceti	6.3	1.72	3.9	10 24.9	4 5 48.3	+11 59.0	+0.3780	0.5267	0.1431	+58	-10
μ Ceti	4.4	1.71	4.0	9 47.5	7 3.8	-10 47.7	+1.2477	0.5270	0.1421	+90	+52
147 B. Arietis	5.8	1.64	1.7	12 53.5	18 0.8	- 0 10.3	-0.6755	0.5302	0.1323	- 3	-75
8 B. Tauri	6.2	1.53	0.9	12 21.5	5 2 59.9	+ 8 32.5	+1.0624	0.5332	0.1234	+90	+35
f Tauri	4.3	+1.51	+ 0.5	+12 40.4	6 21.4	+11 47.9	+1.1215	0.5344	+0.1198	+90	+41
30 B. Tauri	6.4	1.51	- 0.8	15 10.7	9 46.9	- 8 52.9	-1.2340	0.5357	0.1161	-49	-75
179 B. Tauri	5.9	1.35	2.2	14 57.4	6 0 30.8	+ 5 23.5	+0.5948	0.5417	0.0986	+78	+ 7
48 Tauri	6.3	1.32	2.6	15 12.5	4 26.0	+ 9 11.3	+0.6951	0.5433	0.0936	+90	+14
γ Tauri	3.9	1.30	2.9	15 26.5	6 22.6	+11 4.2	+0.6182	0.5441	0.0911	+80	+10
58 Tauri	5.4	+1.28	- 2.8	+14 54.7	6 46.6	+11 27.4	+1.2356	0.5443	+0.0905	+90	+58
63 Tauri	5.7	1.29	3.5	16 35.9	8 6.6	-11 15.1	-0.4914	0.5449	0.0888	+ 7	-55
64 Tauri	4.9	1.30	3.7	17 15.9	8 25.6	-10 56.7	-1.1944	0.5450	0.0883	-45	-73
70 Tauri	6.4	1.27	3.3	15 45.9	9 11.0	-10 12.7	+0.5141	0.5453	0.0873	+70	+ 4
71 Tauri	4.6	1.26	3.2	15 26.6	9 32.1	- 9 52.3	+0.8964	0.5455	0.0868	+90	+27
75 Tauri	5.2	+1.26	- 3.5	+16 11.3	10 32.1	- 8 54.3	+0.1688	0.5460	+0.0855	+45	-15
θ^1 Tauri	4.2	1.26	3.4	15 47.5	10 36.1	- 8 50.4	+0.6077	0.5460	0.0854	+79	+ 9
θ^2 Tauri	3.6	1.26	3.4	15 42.0	10 38.7	- 8 47.9	+0.7110	0.5460	0.0853	+90	+16
80 Tauri	5.8	1.24	3.4	15 28.2	11 21.5	- 8 6.4	+1.0232	0.5463	0.0844	+90	+37
264 B. Tauri	4.8	1.25	3.6	16 1.6	11 33.1	- 7 55.2	+0.4309	0.5464	0.0841	+63	0
81 Tauri	5.5	+1.24	- 3.4	+15 31.5	11 36.0	- 7 52.4	+0.9840	0.5464	+0.0840	+90	+34
85 Tauri	6.0	1.24	3.5	15 41.2	12 10.8	- 7 18.7	+0.8550	0.5466	0.0832	+90	+25
275 B. Tauri	6.5	1.23	3.7	16 9.7	13 1.5	- 6 29.6	+0.4054	0.5470	0.0821	+61	- 2
α Tauri (Aldebar.)	1.1	1.23	4.0	16 21.3	14 6.8	- 5 26.4	+0.2831	0.5475	0.0806	+52	- 8
89 Tauri	5.8	1.21	3.9	15 52.7	15 11.2	- 4 24.1	+0.8879	0.5480	0.0791	+90	+28
σ^1 Tauri	5.2	+1.20	- 3.9	+15 38.9	15 40.0	- 3 56.2	+1.1773	0.5482	+0.0784	+90	+52

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
σ^2 Tauri	4.9	+1.20	-3.9	+15 45.9	6 15 43.3	- 3 53.0	+1.0538	0.5482	+0.0783	+90	+40
318 B. Tauri	5.7	1.12	5.0	17 2.0	7 0 16.4	+ 4 23.4	+0.2875	0.5519	0.0659	+53	- 6
m Tauri	5.0	1.11	5.8	18 32.5	4 57.0	+ 8 54.8	-1.0602	0.5540	0.0589	-32	-72
111 Tauri	5.1	1.00	6.1	17 18.7	12 51.7	- 7 26.2	+0.6312	0.5574	0.0465	+90	+18
115 Tauri	5.3	0.99	6.4	17 53.7	14 7.8	- 6 12.7	+0.1164	0.5579	0.0445	+42	-13
117 Tauri	6.0	+0.98	-6.2	+17 10.4	14 32.1	- 5 49.2	+0.9147	0.5581	+0.0438	+90	+33
119 Tauri	4.9	0.97	6.7	18 32.2	16 26.1	- 3 58.7	-0.4779	0.5589	0.0407	+ 8	-50
167 H ¹ . Tauri	5.5	0.95	6.3	17 0.0	16 28.5	- 3 56.7	+1.1838	0.5589	0.0407	+90	+57
120 Tauri	5.6	0.96	6.7	18 29.1	17 2.7	- 3 23.6	-0.3977	0.5592	0.0397	+12	-44
130 Tauri	5.6	0.89	7.0	17 42.0	23 24.8	+ 2 45.5	+0.6688	0.5618	0.0292	+88	+19
19 B. Geminorum	6.2	+0.78	-7.9	+18 42.0	8 11 11.8	- 9 51.5	-0.1806	0.5662	+0.0091	+24	-27
124 H ¹ . Orionis	5.7	0.77	7.7	17 55.6	11 37.3	- 9 26.9	+0.6504	0.5664	0.0083	+86	+20
71 Orionis	5.1	0.77	8.1	19 10.9	11 46.4	- 9 18.2	-0.6919	0.5664	0.0081	- 5	-66
292 B. Orionis	6.5	0.74	7.8	17 47.9	14 44.0	- 6 26.7	+0.8042	0.5674	+0.0028	+90	+30
26 Geminorum	5.2	0.65	8.3	17 43.2	9 0 3.6	+ 2 33.5	+0.8343	0.5704	-0.0137	+90	+30
74 B. Geminorum	6.2	+0.64	-8.4	+18 16.5	2 15.3	+ 4 40.6	+0.2077	0.5710	-0.0176	+48	- 6
110 3. Geminorum	6.2	0.58	8.5	17 51.8	8 52.8	+11 4.1	+0.4875	0.5728	0.0296	+68	+ 9
162 B. Geminorum	5.7	0.48	8.7	17 14.9	21 43.9	- 0 32.1	+0.6033	0.5755	0.0527	+79	+13
NEW MOON.											
σ Leonis	4.1	+0.46	-4.8	+ 6 27.0	14 1 27.4	- 0 22.1	-1.2005	0.5731	-0.1840	-41	-84
80 Leonis	6.4	0.50	5.0	4 17.0	3 31.5	+ 1 37.7	+0.6075	0.5730	0.1850	+77	- 1
89 Leonis	5.7	0.53	4.8	3 29.2	7 16.8	+ 5 15.1	+0.7126	0.5726	0.1868	+90	+ 5
β Virginis	3.8	0.63	4.6	2 11.8	14 25.7	-11 51.1	+0.6667	0.5723	0.1894	+81	+ 2
27 B. Virginis	6.5	0.64	4.3	0 57.5	18 8.3	- 8 16.3	+1.2109	0.5721	0.1904	+90	+42
10 Virginis	6.2	+0.66	-3.7	+ 2 19.8	22 48.8	- 3 45.8	-1.0629	0.5719	-0.1912	-28	-88
13 Virginis	5.9	0.72	3.8	- 0 21.6	15 2 46.0	+ 0 3.2	+0.8885	0.5719	0.1916	+90	+16
η Virginis	4.0	0.73	3.8	0 14.4	3 18.8	+ 0 34.8	+0.6626	0.5719	0.1916	+83	+ 2
γ Virginis (<i>mean</i>)	2.9	0.80	3.0	1 1.7	12 53.9	+ 9 49.7	-0.3801	0.5720	0.1911	+14	-58
38 Virginis	6.1	0.89	3.1	3 8.1	17 56.7	- 9 18.2	+0.7780	0.5722	0.1901	+87	+ 9
k Virginis	5.7	+0.93	-2.8	- 3 23.9	20 46.6	- 6 34.2	+0.5045	0.5723	-0.1893	+67	- 7
46 Virginis	6.1	0.93	2.6	2 57.3	21 11.4	- 6 10.2	-0.0186	0.5723	0.1892	+33	-36
48 Virginis	6.5	0.95	2.6	3 15.0	22 38.4	- 4 46.4	+0.0034	0.5724	0.1888	+35	-35
SATURN	1.1	...	...	4 12.5	16 0 8.1	- 3 19.9	+0.6856	0.5693	0.1867	+84	+ 3
65 Virginis	6.0	1.05	2.1	4 31.4	7 7.8	+ 3 25.1	-0.3046	0.5731	0.1852	+17	-53
66 Virginis	5.7	+1.07	-2.1	- 4 45.8	7 39.9	+ 3 56.0	-0.1620	0.5732	-0.1849	+25	-44
72 Virginis	6.1	1.11	2.2	6 4.4	10 13.6	+ 6 24.4	+0.6851	0.5735	0.1835	+83	+ 3
l Virginis	4.8	1.11	2.1	5 51.6	10 54.3	+ 7 3.5	+0.3451	0.5735	0.1831	+55	-16
80 Virginis	5.6	1.12	1.5	5 0.3	12 27.4	+ 8 33.3	-0.7981	0.5737	0.1822	-11	-90
88 Virginis	6.5	1.20	1.4	6 27.3	18 0.8	-10 5.1	-0.3424	0.5744	0.1786	+14	-56
598 B. Virginis	6.1	+1.25	-1.5	- 7 40.9	20 54.5	- 7 17.6	+0.3786	0.5748	-0.1765	+56	-14
623 B. Virginis	6.5	1.32	1.3	8 53.3	17 0 58.0	- 3 22.7	+0.8854	0.5754	0.1732	+82	+16
95 Virginis	5.4	1.33	1.2	8 56.8	1 59.3	+ 2 23.7	+0.7677	0.5756	0.1724	+82	+ 8
κ Virginis	4.3	1.38	-1.1	9 55.0	4 39.0	+ 0 10.4	+1.2892	0.5760	0.1700	+81	+55
13 Libræ	5.7	1.63	+0.5	11 35.1	22 27.2	- 6 39.9	+0.1062	0.5793	0.1512	+36	-20
ξ^2 Libræ	5.6	+1.64	+0.8	-11 6.0	23 28.5	- 5 40.8	-0.5379	0.5795	-0.1500	+ 1	-71
17 Libræ	6.4	1.64	1.0	10 50.8	0 5.9	- 5 4.9	-0.8874	0.5796	0.1492	-21	-90
18 Libræ	5.9	1.64	1.0	10 50.1	0 23.2	- 4 48.2	-0.9415	0.5797	0.1489	-24	-90
130 B. Libræ	5.9	1.80	2.1	12 5.7	10 58.8	+ 5 24.2	-1.1737	0.5818	0.1349	-46	-90
γ Libræ	4.0	1.91	1.9	14 32.0	15 52.5	+10 7.2	+0.6528	0.5827	0.1278	+72	+ 2
190 B. Libræ	6.5	+1.96	+2.2	-14 47.8	19 11.8	-10 40.9	+0.5042	0.5834	-0.1229	+59	- 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
η Libræ	5.5	+1.97	+2.1	15 25.7	d h m	h m					
195 B. Libræ	4.2	1.99	3.2	13 51.1	18 19 28.1	-10 25.2	+1.1113	0.5834	-0.1225	+75	+35
202 B. Libræ	6.4	2.02	3.3	14 10.4	22 39.9	-7 20.5	-0.8216	0.5840	0.1175	-20	-90
203 B. Libræ	6.2	2.03	3.2	14 36.2	19 0 35.4	-5 29.3	-0.7690	0.5841	0.1145	-17	-90
48 Libræ	4.6	2.02	3.5	14 3.4	0 43.0	-5 22.0	-0.3162	0.5844	0.1143	+7	-56
					1 24.7	-4 41.8	-0.9803	0.5845	0.1132	-31	-90
49 Libræ	5.4	+2.05	+2.6	16 18.4	2 18.2	-3 50.2	+1.2042	0.5847	-0.1117	+74	+46
91 B. Scorpïi	6.1	2.13	4.4	14 39.4	8 47.7	+2 24.8	-1.1647	0.5858	0.1010	-48	-90
98 B. Scorpïi	6.1	2.15	4.6	14 41.1	10 6.6	+3 40.8	-1.2667	0.5860	0.0988	-63	-85
ϕ Ophiuchi	1.4	2.24	4.7	16 26.7	15 8.6	+8 31.5	+0.0184	0.5867	0.0901	+27	-32
24 Scorpïi	5.0	2.31	5.0	17 35.6	19 28.0	-11 18.8	+0.8466	0.5873	0.0824	+73	+15
78 B. Ophiuchi	6.5	+2.38	+6.3	16 41.0	20 1 28.6	-5 31.6	-0.5445	0.5879	-0.0715	-8	-73
90 B. Ophiuchi	6.5	2.41	5.9	18 7.7	2 53.9	-4 3.7	+0.8257	0.5880	0.0686	+72	+14
125 B. Ophiuchi	6.2	2.44	6.8	17 30.4	6 32.0	-0 39.5	-0.0408	0.5883	0.0621	+19	-37
164 B. Ophiuchi	6.0	2.50	7.5	17 40.5	11 21.2	+3 58.9	-0.1459	0.5885	0.0529	+12	-44
192 B. Ophiuchi	6.3	2.54	7.6	18 22.4	13 18.1	+5 51.3	+0.4703	0.5886	0.0492	+50	-8
305 B. Ophiuchi	6.3	+2.68	+9.5	18 47.2	21 2 15.9	-5 40.0	+0.4215	0.5884	-0.0241	+44	-11
64 B. Sagittarii	6.1	2.75	10.7	18 41.0	10 24.4	+2 10.2	+0.1846	0.5877	0.0081	+27	-24
6 B. Scuti	5.9	2.73	11.2	17 23.9	11 7.5	+2 51.6	-1.1164	0.5876	0.0067	-56	-90
52 G. Sagittarii	6.4	2.75	10.9	18 29.4	11 13.7	+2 57.6	-0.0211	0.5876	0.0065	+15	-36
17 H. Sagittarii	6.4	2.76	10.9	18 38.8	11 44.6	+3 27.4	+0.1385	0.5876	0.0055	+24	-27
Y Sagittarii (var.)	5.4	+2.77	+11.0	18 53.5	12 50.9	+4 31.2	+0.3866	0.5874	-0.0033	+39	-13
85 B. Sagittarii	6.0	2.77	11.7	17 50.7	15 35.9	+7 10.0	0.6370	0.5870	+0.0020	-23	-90
95 B. Sagittarii	5.7	2.80	11.6	18 46.5	16 31.6	+8 3.7	+0.2671	0.5869	0.0038	+31	-20
100 B. Sagittarii	5.0	2.80	11.8	18 27.2	17 3.0	+8 33.9	0.0631	0.5868	0.0049	+12	-39
171 B. Sagittarii	6.1	2.91	13.4	19 21.3	22 6 18.7	-2 39.8	+1.1064	0.5841	0.0303	+71	+36
173 B. Sagittarii	6.4	+2.91	+13.4	19 12.7	6 20.2	-2 38.3	+0.9585	0.5841	+0.0304	+71	+23
187 B. Sagittarii	6.4	2.91	13.7	18 51.3	8 2.5	-0 59.8	+0.6427	0.5837	0.0336	+63	+2
190 B. Sagittarii	5.4	2.92	13.7	19 24.5	8 30.9	-0 32.4	+1.2343	0.5835	0.0345	+71	+54
d Sagittarii	5.0	2.94	14.3	19 5.2	12 29.2	+3 17.2	+1.0536	0.5824	0.0418	+71	+31
ρ Sagittarii	4.0	2.93	14.8	17 59.4	14 13.1	+4 57.2	-0.0131	0.5820	0.0450	+19	-36
45 Sagittarii	6.0	+2.94	+14.6	18 26.9	14 16.9	+5 0.9	+0.4671	0.5820	+0.0452	+49	-8
267 B. Sagittarii	5.8	2.97	15.5	18 23.9	20 47.0	+11 16.9	+0.7491	0.5799	0.0569	+72	+8
54 Sagittarii	5.4	2.95	16.0	16 28.0	22 22.8	-11 10.8	-1.1739	0.5794	0.0597	54	-90
31 B. Capricorni	6.4	3.02	13.3	15 59.5	23 19 18.9	+9 0.7	-0.0556	0.5712	0.0943	+22	-38
27 G. Capricorni	6.2	3.01	18.4	15 18.6	20 21.8	+10 1.3	-0.6735	0.5707	0.0959	-13	-88
47 B. Capricorni	6.2	+3.03	+18.4	16 47.2	22 19.6	+11 55.1	+1.0712	0.5698	+0.0988	+74	+32
τ Capricorni	5.2	3.02	18.8	15 13.2	24 0 0.7	-10 27.3	-0.4086	0.5691	0.1013	+3	-61
61 B. Capricorni	5.9	3.03	18.7	16 23.6	0 34.1	-9 55.1	+0.8840	0.5689	0.1021	+74	+17
95 B. Capricorni	5.9	3.02	19.5	14 46.6	8 45.0	-2 1.1	+0.0611	0.5651	0.1136	+30	-31
53 B. Aquarii	6.5	3.02	20.0	13 31.0	16 38.5	+5 36.4	-0.3346	0.5615	0.1238	+10	-56
18 Aquarii	5.5	+3.02	+20.3	13 12.2	20 24.8	+9 15.2	0.1910	0.5597	+0.1283	+18	-46
λ Capricorni	5.5	3.01	20.8	11 43.0	25 6 50.4	-4 40.0	-0.3748	0.5548	0.1338	+9	-58
151 B. Capricorni	6.1	3.01	20.8	13 4.6	8 18.8	-3 14.5	+1.2827	0.5540	0.1413	+77	+56
96 B. Aquarii	6.5	3.00	20.9	10 40.1	10 10.9	+1 26.0	-1.0192	0.5532	0.1432	-30	-90
150 B. Aquarii	6.0	2.98	21.1	9 25.1	21 18.1	+9 19.6	-0.7107	0.5480	0.1531	-8	-90
167 G. Aquarii	6.3	+2.96	+21.1	8 17.5	23 7 44.5	-4 33.8	-0.2820	0.5435	+0.1608	+17	-52
213 B. Aquarii	6.5	2.95	21.1	8 42.5	10 2.6	-2 20.1	+0.5384	0.5425	0.1623	+67	-5
67 Aquarii	6.4	2.95	21.0	7 21.6	10 8.3	-2 14.5	0.8975	0.5425	0.1623	-19	-90
λ Aquarii	3.8	2.94	21.0	7 59.0	14 45.6	+2 14.2	+0.5304	0.5406	0.1650	+67	-6
78 Aquarii	6.3	2.94	20.9	7 36.5	15 43.8	+3 10.6	+0.2861	0.5402	0.1656	+50	-19
81 Aquarii	6.4	+2.93	+20.9	7 28.1	19 7.4	+6 27.9	+0.7008	0.5389	+0.1673	+83	+4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

THE STAR'S					AT CONJUNCTION IN R. A.					Limit- ing Par- allels.		
Name.		Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
			$\Delta\alpha$	$\Delta\delta$								
			<i>s</i>	<i>"</i>	<i>° ' "</i>	<i>d h m</i>	<i>h m</i>				<i>°</i>	<i>"</i>
82	Aquarii	6.4	+2.93	+20.8	6 58.9	26 19 41.8	+ 7 1.2	+0.2710	0.5387	+0.1676	+49	-20
	URANUS	6.1	...	...	6 11.6	27 1 24.1	-11 26.9	+0.4362	0.5383	0.1709	+61	-11
ϕ	Aquarii	4.4	2.91	20.5	6 27.5	1 35.4	-11 15.9	+0.7018	0.5365	0.1702	+84	+ 4
96	Aquarii	5.7	2.91	20.5	5 32.4	4 8.1	- 8 47.6	+0.1420	0.5356	0.1712	+42	-27
316 B.	Aquarii	6.5	2.92	20.3	4 20.0	4 34.6	- 8 22.2	-1.0909	0.5354	0.1714	-32	-90
317 B.	Aquarii	6.3	+2.89	+20.5	6 19.4	4 47.9	- 8 9.3	+1.1039	0.5353	+0.1715	+84	+32
337 B.	Aquarii	6.4	2.90	20.1	4 56.8	9 16.0	- 3 49.3	+0.3816	0.5338	0.1730	+58	-14
342 B.	Aquarii	6.5	2.90	20.0	4 30.2	10 16.7	- 2 50.4	+0.0746	0.5335	0.1732	+38	-31
20	Piscium	5.6	2.87	19.6	3 11.1	18 39.3	+ 5 17.2	+0.1013	0.5310	0.1752	+40	-29
24	Piscium	6.1	2.85	19.4	3 34.7	21 12.7	+ 7 46.0	+0.9787	0.5302	0.1756	+87	+22
80 B.	Piscium	6.3	+2.84	18.7	0 55.5	28 3 27.9	10 10.0	-0.8152	0.5287	+0.1762	-11	-90
10	Ceti	6.4	2.80	17.9	0 28.2	14 38.6	+ 0 41.0	+0.6580	0.5263	0.1761	+83	+ 2
155 B.	Piscium	6.5	2.77	16.0	2 58.3	29 3 31.5	10 48.6	-0.8619	0.5244	0.1742	-14	-88
77	Piscium	6.1	2.75	15.0	4 30.2	11 7.7	- 3 25.7	-1.2316	0.5236	0.1722	-45	-86
<i>f</i>	Piscium	5.3	2.69	14.7	3 12.8	17 25.5	+ 2 41.2	+1.2673	0.5233	0.1700	+90	+50
μ	Piscium	5.0	+2.70	+13.4	5 45.1	23 54.0	+ 8 58.4	-0.4405	0.5231	+0.1673	+10	-62
ν	Piscium	4.7	2.63	13.0	5 6.1	5 49.2	- 9 16.7	+1.2597	0.5232	0.1645	+90	+50
39 B.	Arietis	6.5	2.59	11.0	7 22.2	18 3.8	+ 236.6	+0.7259	0.5240	0.1575	+90	+ 8
64	Ceti	5.8	2.57	10.3	8 12.8	21 27.5	+ 5 54.3	+0.3234	0.5243	0.1552	+54	-15
ξ^1	Ceti	4.5	2.57	10.2	8 29.3	22 18.6	+ 6 43.9	+0.1500	0.5244	0.1547	+44	-24
ξ	Arietis	5.5	+2.56	+ 8.9	10 15.9	31 4 26.6	-11 18.9	-0.8817	0.5252	+0.1503	-16	-80
25	Arietis	6.5	2.52	8.8	9 51.6	5 47.8	- 9 59.9	-0.2301	0.5254	0.1493	+22	-45
389 B.	Ceti	6.3	2.52	8.9	9 13.5	6 55.8	- 8 51.0	+0.6417	0.5256	0.1484	+82	+ 4
85	Ceti	6.3	2.48	7.7	10 25.0	13 35.4	- 2 26.2	+0.2928	0.5267	0.1431	+53	-15
μ	Ceti	4.4	+2.48	+ 7.8	9 47.5	14 51.1	- 1 12.7	+1.1644	0.5270	+0.1420	+90	+42

SEPTEMBER.

147 B. Arietis	5.8	+2.43	+ 5.4	+12 53.6	1 1 50.4	+ 9 26.9	-0.7624	0.5294	+0.1321	- 8	-78
8 B. Tauri	6.2	2.33	4.4	12 21.5	10 52.6	- 5 47.1	+0.9821	0.5317	0.1231	+90	+29
<i>f</i> Tauri	4.3	+2.31	+ 3.9	+12 40.5	14 15.4	- 2 30.5	+1.0422	0.5327	+0.1195	+90	+34
179 B. Tauri	5.9	2.17	0.7	14 57.5	2 8 34.7	- 8 44.9	+0.5181	0.5385	0.0983	+70	+ 3
48 Tauri	6.3	2.13	+ 0.2	15 12.6	12 32.5	- 4 54.4	+0.6201	0.5399	0.0933	+81	+ 9
γ Tauri	3.9	2.12	- 0.2	15 26.6	14 30.5	- 3 0.1	+0.5438	0.5406	0.0907	+73	+ 5
58 Tauri	5.4	2.10	0.0	14 54.7	14 54.7	- 2 36.8	+1.1644	0.5407	0.0902	+90	+49
63 Tauri	5.7	+2.11	- 0.8	+16 35.9	16 15.7	- 1 18.2	-0.5708	0.5412	+0.0884	+ 2	-62
64 Tauri	4.9	2.12	1.1	17 16.0	16 35.0	- 0 59.6	-1.2772	0.5412	0.0880	-61	-73
70 Tauri	6.4	2.09	0.6	15 46.0	17 20.9	- 0 15.1	+0.4401	0.5416	0.0870	+64	0
71 Tauri	4.6	2.08	0.6	15 26.7	17 42.3	+ 0 5.6	+0.8245	0.5417	0.0865	+90	+22
75 Tauri	5.2	2.08	0.9	16 11.3	18 43.0	+ 1 4.5	+0.0935	0.5421	0.0851	+40	-19
θ^1 Tauri	4.2	+2.07	- 0.8	+15 47.5	18 47.1	+ 1 8.4	+0.5346	0.5421	+0.0851	+72	+ 5
θ^2 Tauri	3.6	2.07	0.8	15 42.1	18 49.7	+ 1 10.9	+0.6386	0.5422	0.0850	+83	+11
80 Tauri	5.8	2.06	0.8	15 28.3	19 33.1	+ 1 52.9	+0.9525	0.5424	0.0840	+90	+31
264 B. Tauri	4.8	2.07	1.0	16 1.6	19 44.8	+ 2 4.2	+0.3572	0.5425	0.0837	+57	- 4
81 Tauri	5.5	2.06	0.8	15 31.5	19 47.8	+ 2 7.2	+0.9133	0.5425	0.0837	+90	+29
85 Tauri	6.0	+2.05	- 1.0	+15 41.2	20 23.0	+ 2 41.2	+0.7838	0.5427	+0.0829	+90	+20
275 B. Tauri	6.5	2.05	1.2	16 9.8	21 14.4	+ 3 31.0	+0.3322	0.5430	0.0817	+56	- 6
α Tauri (<i>Aldebar.</i>)	1.1	2.04	1.6	16 21.3	22 20.5	+ 4 35.1	+0.2096	0.5434	0.0802	+48	-12
89 Tauri	5.8	2.02	1.4	15 52.8	23 25.7	+ 5 38.1	+0.8180	0.5438	0.0787	+90	+23
σ^1 Tauri	5.2	2.01	1.4	15 38.9	23 54.9	+ 6 6.4	+1.1091	0.5440	0.0781	+90	+45
σ^2 Tauri	4.9	+2.01	- 1.4	+15 46.0	23 58.2	+ 6 9.6	+0.9850	0.5440	+0.0780	+90	+34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
		<i>s</i>	<i>"</i>	<i>°</i> <i>'</i>	<i>d</i> <i>h</i> <i>m</i>	<i>h</i> <i>m</i>				<i>°</i>	<i>°</i>
318 B. Tauri	5.7	+1.93	-2.9	+17 2.0	3 8 38.5	- 9 26.7	+0.2177	0.5473	+0.0657	+48	-10
<i>m</i> Tauri	5.0	1.93	3.9	18 32.5	13 23.4	- 4 50.9	-1.1360	0.5491	0.0587	-39	-72
111 Tauri	5.1	1.80	4.4	17 18.7	21 25.4	+ 2 55.3	+0.6288	0.5522	0.0464	+83	+15
115 Tauri	5.3	1.78	4.8	17 53.8	22 42.7	+ 4 10.1	+0.0511	0.5527	0.0444	+38	-17
117 Tauri	6.0	1.76	4.6	17 10.5	23 7.4	+ 4 34.0	+0.8544	0.5528	0.0437	+90	+29
119 Tauri	4.9	+1.76	-5.2	+18 32.2	4 1 3.6	+ 6 26.4	-0.5458	0.5536	+0.0407	+ 4	-55
167 H ¹ . Tauri	5.5	1.74	4.7	17 0.0	1 5.7	+ 6 28.4	+1.1258	0.5535	0.0406	+90	+50
120 Tauri	5.6	1.75	5.3	18 29.1	1 40.4	+ 7 2.0	-0.4649	0.5538	0.0397	+ 8	-48
122 Tauri	5.5	1.71	5.0	16 59.6	3 20.5	+ 8 38.7	+1.2208	0.5544	0.0371	+90	+61
130 Tauri	5.6	1.66	5.7	17 42.0	8 8.8	-10 42.7	+0.6107	0.5562	0.0293	+80	+15
19 B. Geminorum	6.2	+1.52	-7.1	+18 42.0	20 7.2	+ 0 51.7	-0.2383	0.5605	+0.0094	+21	-30
124 H ¹ . Orionis	5.7	1.51	6.9	17 55.6	20 33.2	+ 1 16.9	+0.5976	0.5606	0.0087	+79	+17
71 Orionis	5.1	1.52	7.4	19 10.9	20 42.4	+ 1 25.8	-0.7524	0.5607	0.0084	- 9	-71
287 B. Orionis	6.2	1.48	6.9	17 21.3	22 38.0	+ 3 17.4	+1.2275	0.5614	0.0051	+90	+65
292 B. Orionis	6.5	1.47	7.1	17 47.9	23 43.0	+ 4 20.2	+0.7536	0.5618	+0.0033	+90	+27
26 Geminorum	5.2	+1.35	-7.8	+17 43.2	5 9 11.3	-10 30.8	+0.7880	0.5648	-0.0131	+90	+28
74 B. Geminorum	6.2	1.33	8.2	18 16.5	11 25.1	- 8 21.6	+0.1591	0.5656	0.0170	+44	- 8
110 B. Geminorum	6.2	1.24	8.4	17 51.8	18 8.4	- 1 52.3	+0.4434	0.5675	0.0289	+64	+ 6
162 B. Geminorum	5.7	1.09	8.9	17 14.9	6 7 9.7	+10 41.7	+0.5654	0.5710	0.0519	+75	+11
<i>f</i> Geminorum	5.3	1.05	9.2	17 50.9	10 31.9	-10 3.2	-0.2523	0.5718	0.0578	+20	-36
1 Cancrī	6.0	+0.96	-9.0	+15 59.7	18 14.2	- 2 37.2	+1.1973	0.5734	-0.0713	+90	+55
2 B. Cancrī	6.0	0.95	9.1	16 43.5	18 53.8	- 1 59.1	+0.3838	0.5735	0.0724	+59	- 1
3 Cancrī	5.7	0.95	9.4	17 31.1	19 52.6	- 1 2.3	-0.5194	0.5737	0.0741	+ 5	-56
5 Cancrī	5.9	0.91	9.2	16 40.0	20 12.0	- 0 43.6	+0.3490	0.5737	0.0747	+57	- 3
ζ Cancrī (<i>mean</i>)	4.7	0.90	9.6	17 52.7	7 0 51.3	+ 3 45.8	-1.2839	0.5746	0.0827	-67	-72
<i>d</i> ² Cancrī	6.2	+0.82	-9.6	+17 17.9	6 48.1	+ 9 29.9	-1.1962	0.5755	-0.0927	-45	-73
90 B. Cancrī	6.3	0.79	9.1	15 34.7	11 17.2	-10 10.5	+0.1601	0.5761	0.1002	+44	-16
54 Cancrī	6.3	0.72	9.0	15 38.1	17 44.8	- 3 56.9	-0.5787	0.5768	0.1106	+ 2	-64
α^1 Cancrī	5.1	0.71	9.0	15 37.0	20 26.1	- 1 21.3	-0.8618	0.5771	0.1149	-15	-75
α^2 Cancrī	5.7	0.71	9.1	+15 52.5	20 34.7	- 1 13.0	-1.1454	0.5771	0.1151	-38	-75
NEW MOON.											
SATURN	1.0	...	...	- 5 19.1	12 12 17.4	+10 27.8	+0.9716	0.5783	-0.1876	+85	+22
65 Virginis	6.0	+0.80	-1.1	4 31.3	14 45.5	-11 9.5	-0.2850	0.5827	0.1881	+18	-52
66 Virginis	5.7	0.81	1.1	4 45.7	15 16.6	-10 39.6	-0.1443	0.5827	0.1879	+26	-43
72 Virginis	6.1	+0.84	-1.1	- 6 4.4	17 45.8	- 8 15.8	+0.6912	0.5830	-0.1865	+83	+ 4
<i>l</i> Virginis	4.8	0.83	1.0	5 51.5	18 25.2	- 7 37.9	+0.3560	0.5830	0.1861	+55	-15
80 Virginis	5.6	0.84	0.6	5 0.3	19 55.4	- 6 10.9	-0.7710	0.5832	0.1852	- 9	-90
566 B. Virginis	6.4	0.87	0.2	5 6.7	23 28.1	- 2 46.0	-1.3172	0.5837	0.1828	-62	-82
88 Virginis	6.5	0.90	0.3	6 27.2	13 1 18.9	- 0 59.4	-0.3215	0.5839	0.1815	+16	-54
598 B. Virginis	6.1	+0.93	-0.3	- 7 40.8	4 7.5	+ 1 43.1	+0.3898	0.5842	-0.1793	+57	-13
623 B. Virginis	6.5	0.99	-0.1	8 53.3	8 3.8	+ 5 30.6	+0.8899	0.5847	0.1760	+82	+16
95 Virginis	5.4	0.99	0.0	8 56.8	9 3.3	+ 6 27.9	+0.7738	0.5848	0.1751	+82	+ 9
κ Virginis	4.3	1.04	+0.2	9 55.0	11 38.4	+ 8 57.3	+1.2884	0.5852	0.1727	+81	+55
13 Libræ	5.7	1.23	1.7	11 35.1	14 4 57.2	+ 1 37.6	+0.1213	0.5874	0.1534	+37	-28
ξ^2 Libræ	5.6	+1.23	+2.0	-11 6.0	5 56.8	+ 2 35.0	-0.5150	0.5875	-0.1521	+ 2	-69
17 Libræ	6.4	1.24	2.1	10 50.7	6 33.3	+ 3 10.1	-0.8604	0.5876	0.1514	-19	-90
18 Libræ	5.9	1.23	2.1	10 50.1	6 50.2	+ 3 26.4	-0.9139	0.5876	0.1510	-23	-90
130 B. Libræ	5.9	1.37	3.1	12 5.7	17 10.4	-10 36.7	-1.1452	0.5888	0.1366	-43	-90
γ Libræ	4.0	1.47	3.0	14 32.0	21 57.6	- 6 0.2	+0.6612	0.5893	0.1294	+72	+ 2
190 B. Libræ	6.5	+1.50	+3.3	-14 47.8	15 1 12.7	- 2 52.5	+0.5140	0.5896	-0.1243	+60	- 6

OCCULTATIONS, 1923.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.								Limiting Par- allels		
Name.		Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H		Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$		d	h	m	h	m					
η	Libræ	5.5	+1.52	+ 3.1	-15 25.7	15	1 28.7	- 2 37.2	+1.1150	0.5896	-0.1239	+75	+35		
195 B.	Libræ	6.2	1.53	4.1	13 54.1		4 36.7	+ 0 23.8	-0.7992	0.5899	0.1188	-18	-90		
202 B.	Libræ	6.4	1.56	4.2	14 10.4		6 30.0	+ 2 12.9	-0.7475	0.5900	0.1157	-15	-90		
203 B.	Libræ	6.2	1.57	4.1	14 36.2		6 37.4	+ 2 20.0	-0.3286	0.5901	0.1155	+ 9	-55		
48	Libræ	4.6	1.56	4.4	14 3.4		7 18.3	+ 2 59.3	-0.9570	0.5901	0.1143	-29	-90		
49	Libræ	5.4	+1.58	+ 3.5	-16 18.4		8 10.9	+ 3 49.9	+1.2074	0.5901	-0.1129	+74	+46		
91 B.	Scorpii	6.1	1.66	5.2	14 39.3		14 33.6	+ 9 58.2	-1.1417	0.5905	0.1020	-46	-90		
98 B.	Scorpii	6.1	1.68	5.3	14 41.1		15 51.4	+11 13.0	-1.2433	0.5905	0.0997	-59	-90		
ϕ	Ophiuchi	4.4	1.76	5.4	16 26.7		20 48.9	- 8 0.8	+0.0607	0.5906	0.0908	+27	-31		
24	Scorpii	5.0	1.84	5.6	17 35.6	16	1 5.0	- 3 54.3	+0.8532	0.5906	0.0831	+73	+15		
78 B.	Ophiuchi	6.5	+1.90	+ 6.8	-16 41.0		7 1.5	+ 1 48.7	-0.5300	0.5905	-0.0720	- 7	-71		
90 B.	Ophiuchi	6.5	1.93	6.4	18 7.7		8 31.9	+ 3 15.6	+0.8324	0.5904	0.0691	+72	+14		
125 B.	Ophiuchi	6.2	1.96	7.1	17 30.4		12 2.1	+ 6 37.9	-0.0299	0.5903	0.0624	+20	-37		
164 B.	Ophiuchi	6.0	2.02	7.8	17 40.5		16 49.2	+11 14.3	-0.1352	0.5899	0.0532	+13	-43		
192 B.	Ophiuchi	6.3	2.06	7.8	18 22.4		18 45.4	-10 54.0	+0.4783	0.5897	0.0494	+50	- 8		
305 B.	Ophiuchi	6.3	+2.22	+ 9.4	-18 47.2	17	7 40.7	+ 1 32.2	+0.4288	0.5879	-0.0242	+44	-10		
61 B.	Sagittarii	6.1	2.30	10.5	18 41.0		15 49.4	+ 9 22.6	+0.1914	0.5862	0.0082	+27	-24		
6 B.	Scuti	5.9	2.29	11.0	17 23.9		16 32.6	+10 4.1	-1.1389	0.5861	0.0068	-55	-90		
52 G.	Sagittarii	6.4	2.31	10.6	18 29.4		16 38.8	+10 10.0	-0.0146	0.5861	-0.0066	+15	-36		
17 H ¹ .	Sagittarii	6.4	2.32	10.7	18 38.8		17 9.7	+10 39.9	+0.1451	0.5860	0.0056	+24	-26		
Υ	Sagittarii (var.)	5.4	+2.33	+10.8	-18 53.5		18 16.2	+11 43.9	+0.3931	0.5857	-0.0035	+40	-12		
85 B.	Sagittarii	6.0	2.35	11.5	17 50.7		21 1.7	- 9 36.7	-0.6907	0.5851	+0.0019	-23	-90		
95 B.	Sagittarii	5.7	2.37	11.2	18 46.5		21 57.6	- 8 42.9	+0.2732	0.5848	0.0037	+32	-19		
100 B.	Sagittarii	5.0	2.37	11.4	18 27.2		22 29.1	- 8 12.6	-0.0573	0.5847	0.0047	+13	-38		
171 B.	Sagittarii	6.1	2.52	12.7	19 21.3	18	11 49.5	+ 4 38.3	+1.1130	0.5808	0.0301	+71	+37		
173 B.	Sagittarii	6.4	+2.52	+12.8	-19 12.7		11 51.0	+ 4 39.8	+0.9618	0.5808	+0.0301	+71	+24		
187 B.	Sagittarii	6.4	2.53	13.1	18 51.3		13 34.1	+ 6 19.1	+0.6483	0.5802	0.0333	+63	+ 2		
190 B.	Sagittarii	5.4	2.54	13.0	19 24.5		14 2.8	+ 6 46.7	+1.2112	0.5800	0.0341	+71	+55		
d	Sagittarii	5.0	2.57	13.6	19 5.2		18 3.1	+10 38.4	+1.0602	0.5786	0.0415	+71	+32		
ρ	Sagittarii	4.0	2.57	14.1	17 59.4		19 48.0	-11 40.6	-0.0095	0.5780	0.0446	+19	-35		
45	Sagittarii	6.0	+2.58	+13.9	-18 26.9		19 51.9	-11 36.7	+0.4721	0.5780	+0.0447	+49	- 8		
267 B.	Sagittarii	5.8	2.63	14.7	18 23.9	19	2 26.0	- 5 16.7	+0.7548	0.5755	0.0564	+72	+ 9		
54	Sagittarii	5.1	2.62	15.5	16 28.0		4 2.9	- 3 43.3	-1.1753	0.5749	0.0592	54	-90		
31 B.	Capricorni	6.4	2.78	17.6	15 59.5	20	1 15.4	- 7 15.4	-0.0542	0.5660	0.0934	+22	-38		
27 G.	Capricorni	6.2	2.77	17.7	15 18.6		2 19.2	- 6 13.8	-0.6752	0.5655	0.0949	-13	-88		
47 B.	Capricorni	6.2	+2.81	+17.5	-16 47.2		4 18.7	- 4 18.4	+1.0785	0.5646	+0.0979	+74	+32		
τ	Capricorni	5.2	2.80	18.1	15 13.2		6 1.3	- 2 39.3	-0.4091	0.5639	0.1003	+ 3	-61		
61 B.	Capricorni	5.9	2.81	17.9	16 23.6		6 35.2	- 2 6.6	+0.8903	0.5636	0.1011	+74	+17		
95 B.	Capricorni	5.9	2.85	18.8	14 46.6		14 53.4	+ 5 54.7	+0.0631	0.5599	0.1125	+30	-31		
53 B.	Aquarii	6.5	2.88	19.5	13 31.0		22 54.0	-10 20.6	-0.3348	0.5563	0.1227	+10	-56		
18	Aquarii	5.5	+2.90	+19.8	-13 12.2	21	2 43.8	- 6 38.4	-0.1903	0.5546	+0.1272	+18	-46		
λ	Capricorni	5.5	2.94	20.5	11 43.0		13 18.6	+ 3 35.8	-0.3745	0.5501	0.1387	+ 9	-58		
151 B.	Capricorni	6.1	2.95	20.3	13 4.6		14 48.3	+ 5 2.5	+1.2928	0.5494	0.1402	+77	+59		
96 B.	Aquarii	6.5	2.95	20.8	10 40.1		16 41.9	+ 6 52.5	-1.0224	0.5486	0.1421	-30	-90		
150 B.	Aquarii	6.0	2.98	21.2	9 25.1	22	3 58.3	- 6 12.6	-0.7106	0.5440	0.1521	- 8	-90		
167 G.	Aquarii	6.3	+3.01	+21.4	- 8 17.5		14 32.4	+ 4 1.7	-0.2779	0.5400	+0.1599	+17	-51		
213 B.	Aquarii	6.5	3.02	21.3	8 42.5		16 52.1	+ 6 17.1	+0.5471	0.5393	0.1614	+68	- 5		
67	Aquarii	6.4	3.02	21.5	7 21.6		16 57.9	+ 6 22.7	-0.8962	0.5392	0.1615	-19	-90		
λ	Aquarii	3.8	3.03	21.4	7 59.0		21 38.2	+10 54.5	+0.5399	0.5376	0.1643	+68	- 5		
78	Aquarii	6.3	3.03	21.4	7 36.5		22 37.1	+11 51.5	+0.2945	0.5373	0.1649	+50	-18		
81	Aquarii	6.4	+3.04	+21.3	- 7 28.1	23	2 2.6	- 8 49.2	+0.7119	0.5361	+0.1667	+83	+ 5		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.		
Name.		Mag.	Red'n's from 1923.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, H	Y	x'	y'	N.	S.
			$\Delta\alpha$	$\Delta\delta$										
			s	"	°	d	h	m	h	m			°	'
82	Aquarii	6.4	+3.04	+21.4	- 6 58.9	23	2	37.5	- 8 15.5	+0.2801	0.5360	+0.1670	+50	-19
	URANUS	6.1	...	...	6 39.5		6	21.9	- 4 37.9	+0.5578	0.5365	0.1695	+70	- 4
ϕ	Aquarii	4.4	3.05	21.1	6 27.5		8	34.4	- 2 29.4	+0.7140	0.5342	0.1697	+84	+ 5
96	Aquarii	5.7	3.07	21.2	5 32.4		11	8.7	+ 0 0.2	+0.1523	0.5334	0.1707	+43	-26
316 B.	Aquarii	6.5	3.08	21.2	4 20.0		11	35.1	+ 0 25.9	-1.0858	0.5334	0.1709	-31	-90
317 B.	Aquarii	6.3	+3.05	+21.1	- 6 19.4		11	48.5	+ 0 38.8	+1.1185	0.5332	+0.1710	+84	+33
337 B.	Aquarii	6.4	3.08	21.0	4 56.8		16	18.7	+ 5 1.0	+0.3941	0.5320	0.1726	+58	-13
342 B.	Aquarii	6.5	3.08	21.0	4 30.1		17	19.8	+ 6 0.2	+0.0862	0.5318	0.1729	+39	-30
20	Piscium	5.6	3.09	20.8	3 11.0	24	1	45.8	- 9 48.6	+0.1152	0.5298	0.1750	+41	-28
24	Piscium	6.1	3.09	20.6	3 34.6		4	20.1	- 7 19.0	+0.9964	0.5292	0.1755	+87	+23
80 B.	Piscium	6.3	+3.11	+20.3	- 0 55.5		10	37.2	- 1 13.2	-0.8016	0.5280	+0.1763	-10	-90
10	Ceti	6.4	3.11	19.5	- 0 28.2		21	50.2	+ 9 40.3	+0.6797	0.5263	0.1765	+84	+ 3
155 B.	Piscium	6.5	3.14	18.2	+ 2 58.3	25	10	41.7	- 1 47.8	-0.8396	0.5249	0.1748	-13	-88
77	Piscium	6.4	3.16	17.3	4 30.2		18	21.2	+ 5 35.3	-1.2071	0.5245	0.1729	-42	-86
f	Piscium	5.3	3.12	16.8	3 12.8	26	0	39.0	+ 11 42.3	+1.2993	0.5244	0.1708	+88	+57
μ	Piscium	5.0	+3.16	+15.9	+ 5 45.1		7	7.3	- 6 0.6	-0.4092	0.5244	+0.1682	+12	-59
ν	Piscium	4.7	3.12	15.3	5 6.2		13	2.3	- 0 16.0	+1.2963	0.5246	0.1653	+88	+56
39 B.	Arietis	6.5	3.13	13.5	7 22.2	27	1	16.2	+ 11 36.6	+0.7663	0.5254	0.1583	+90	+10
64	Ceti	5.8	3.12	12.8	8 12.8		4	39.7	- 9 5.8	+0.3645	0.5257	0.1561	+57	-12
ξ^1	Ceti	4.5	3.13	12.7	8 29.4		5	30.8	- 8 16.3	+0.1910	0.5258	0.1555	+46	-22
ξ	Arietis	5.5	+3.14	+11.6	+10 15.9		11	38.4	- 2 19.4	0.8404	0.5266	+0.1511	-13	-80
25	Arietis	6.5	3.11	11.4	9 51.6		12	59.6	- 1 0.6	-0.1869	0.5267	0.1501	+24	-42
389 B.	Ceti	6.3	3.11	11.5	9 13.5		14	7.6	+ 0 5.4	+0.6872	0.5269	0.1492	+88	+ 7
85	Ceti	6.3	3.10	10.3	10 25.0		20	47.0	+ 6 33.0	+0.3403	0.5279	0.1438	+56	-12
μ	Ceti	4.4	3.10	10.2	9 47.6		22	2.7	+ 7 46.5	+1.2144	0.5281	0.1427	+90	+48
147 B.	Arietis	5.8	+3.09	+ 7.9	+12 53.6	28	9	2.4	- 5 33.4	-0.7132	0.5301	+0.1327	- 5	-77
8 B.	Tauri	6.2	3.02	6.8	12 21.6		18	5.6	+ 3 13.5	+1.0400	0.5321	0.1235	+90	+33
f	Tauri	4.3	3.00	6.2	12 40.5		21	29.0	+ 6 30.7	+1.1018	0.5328	0.1199	+90	+39
30 B.	Tauri	6.4	3.03	5.0	15 10.8	29	0	56.8	+ 9 52.4	-1.2693	0.5336	0.1161	-55	-75
179 B.	Tauri	5.9	2.92	2.7	14 57.5		15	53.5	+ 0 21.6	+0.5828	0.5375	0.0984	+76	+ 6
48	Tauri	6.3	+2.89	+ 2.1	+15 12.6		19	53.0	+ 4 13.8	+0.6867	0.5386	+0.0933	+90	+13
γ	Tauri	3.9	2.88	1.7	15 26.6		21	51.9	+ 6 8.9	+0.6103	0.5391	0.0908	+80	+ 9
58	Tauri	5.4	2.86	1.8	14 54.8		22	16.3	+ 6 32.6	+1.2344	0.5392	0.0902	+90	+58
63	Tauri	5.7	2.88	1.1	16 35.9		23	38.0	+ 7 51.8	-0.5098	0.5396	0.0885	+ 6	-57
64	Tauri	4.9	2.90	0.8	17 16.0		23	57.4	+ 8 10.5	-1.2201	0.5397	0.0880	-49	-73
70	Tauri	6.4	+2.86	+ 1.2	+15 46.0	30	0	43.7	+ 8 55.3	+0.5071	0.5399	+0.0870	+69	+ 3
71	Tauri	4.6	2.85	1.2	15 26.7		1	5.3	+ 9 16.3	+0.8937	0.5400	0.0865	+90	+27
75	Tauri	5.2	2.85	0.9	16 11.3		2	6.6	+10 15.6	+0.1588	0.5403	0.0851	+44	-15
θ^1	Tauri	4.2	2.84	0.9	15 47.6		2	10.6	+10 19.6	+0.6025	0.5403	0.0851	+79	+ 9
θ^2	Tauri	3.6	2.84	1.0	15 42.1		2	13.3	+10 22.2	+0.7070	0.5403	0.0850	+90	+15
80	Tauri	5.8	+2.83	+ 0.9	+15 28.3		2	57.0	+11 4.5	+1.0230	0.5405	+0.0840	+90	+37
264 B.	Tauri	4.8	2.84	0.7	16 1.7		3	8.9	+11 16.0	+0.4244	0.5406	0.0838	+63	- 1
81	Tauri	5.5	2.83	0.9	15 31.5		3	11.9	+11 18.9	+0.9836	0.5405	0.0837	+90	+34
85	Tauri	6.0	2.83	0.7	15 41.3		3	47.4	+11 53.3	+0.8537	0.5407	0.0829	+90	+25
275 B.	Tauri	6.5	2.82	0.5	16 9.8		4	39.3	-11 16.4	+0.3996	0.5410	0.0817	+61	- 2
α	Tauri (<i>Aldebar</i>)	1.1	+2.82	+ 0.1	+16 21.3		5	46.0	-10 11.8	+0.2766	0.5413	+0.0802	+52	- 9
89	Tauri	5.8	2.80	0.2	15 52.8		6	51.9	- 9 8.0	+0.8890	0.5416	0.0787	+90	+27
σ^1	Tauri	5.2	2.79	0.2	15 39.0		7	21.4	- 8 39.4	+1.1821	0.5417	0.0780	+90	+52
σ^2	Tauri	4.9	2.80	+ 0.2	15 46.0		7	24.7	- 8 36.2	+1.0572	0.5418	0.0779	+90	+40
318 B.	Tauri	5.7	2.73	- 1.5	17 2.0		16	10.8	- 0 6.7	+0.2874	0.5442	0.0655	+53	- 6
m	Tauri	5.0	+2.74	- 2.7	+18 32.5		20	59.2	+ 4 32.5	-1.0750	0.5456	+0.0585	-33	-72

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.		
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.	
		$\Delta\alpha$	$\Delta\delta$									
		s	$''$	$^{\circ}$	d	h	m	h	m	$^{\circ}$	$^{\circ}$	
111 Tauri	5.1	+2.60	-3.5	+17 18.7	1	5	8.1	-11 34.3	+0.7045	0.5481	+0.0462	+90+19
115 Tauri	5.3	2.59	3.9	17 53.8		6	26.6	-10 18.2	+0.1225	0.5484	0.0443	+42-13
117 Tauri	6.0	2.57	3.8	17 10.5		6	51.6	-9 54.1	+0.9323	0.5485	0.0436	+90+34
119 Tauri	4.9	2.58	4.4	18 32.2		8	49.7	-7 59.7	-0.4789	0.5491	0.0405	+8-50
167 II ¹ Tauri	5.5	2.55	3.9	17 0.1		8	51.8	-7 57.7	+1.2064	0.5491	0.0405	+90+59
120 Tauri	5.6	+2.57	-4.5	+18 29.1		9	27.1	-7 23.6	-0.3972	0.5493	+0.0396	+12-44
130 Tauri	5.6	2.47	5.1	17 42.0		16	2.0	-1 1.6	+0.6885	0.5512	0.0292	+90+20
19 B. Geminorum	6.2	2.34	7.0	18 42.0	2	4	14.0	+10 46.3	-0.1671	0.5545	0.0094	+25-26
124 II ¹ Orionis	5.7	2.32	6.8	17 55.6		4	40.5	+11 12.0	+0.6769	0.5546	0.0086	+90+21
71 Orionis	5.1	2.33	7.4	19 10.9		4	49.9	+11 21.0	-0.6859	0.5547	0.0084	-5-66
292 B. Orionis	6.5	+2.28	-7.1	+17 47.9		7	54.2	-9 40.9	+0.8346	0.5555	+0.0033	+90+32
26 Geminorum	5.2	2.15	8.2	17 43.2		17	34.8	-0 19.7	+0.8699	0.5579	-0.0130	+90+33
74 B. Geminorum	6.2	2 12	8.6	18 16.5		19	51.5	+1 52.6	+0.2346	0.5585	0.0168	+49-4
110 B. Geminorum	6.2	2.02	9.1	17 51.8	3	2	44.2	+8 31.4	+0.5216	0.5601	0.0285	+71+11
162 B. Geminorum	5.7	1.84	10.1	17 14.9		16	4.2	-2 35.9	+0.6436	0.5630	0.0513	+84+15
f Geminorum	5.3	+1.80	-10.5	+17 50.9		19	31.4	+0 44.2	-0.1833	0.5637	-0.0571	+24-32
g Geminorum	5.0	1.76	11.0	18 41.8		22	30.4	+3 37.1	-1.2619	0.5643	0.0622	-59-72
1 Cancri	6.0	1.67	10.4	15 59.7	4	3	25.0	+8 21.6	+1.2799	0.5652	0.0705	+77+70
2 B. Cancri	6.0	1.67	10.7	16 43.5		4	5.7	+9 0.8	+0.4578	0.5653	0.0716	+65+3
3 Cancri	5.7	1.66	11.0	17 31.1		5	5.9	+9 58.9	-0.4550	0.5655	0.0733	+9-51
5 Cancri	5.9	+1.65	-10.7	+16 40.0		5	25.8	+10 18.2	+0.4223	0.5656	-0.0738	+62+1
ζ Cancri (<i>mean</i>)	4.7	1.60	11.5	17 52.7		10	11.9	-9 5.6	-1.2285	0.5664	0.0818	-50-73
d^2 Cancri	6.2	1.50	11.5	17 17.9		16	17.3	-3 12.9	-1.1413	0.5674	0.0917	-39-73
90 B. Cancri	6.3	1.11	11.0	15 31.7		20	52.7	+1 12.9	+0.2268	0.5682	0.0991	+49-12
54 Cancri	6.3	1.35	11.1	15 38.0	5	3	29.3	+7 35.6	-0.5213	0.5691	0.1095	+6-59
σ^1 Cancri	5.1	+1.32	-11.2	+15 37.0		6	14.2	+10 14.7	-0.8079	0.5695	-0.1138	-12-75
σ^2 Cancri	5.7	1.32	11.3	15 52.5		6	23.0	+10 23.2	-1.0940	0.5695	0.1140	-33-75
81 Cancri	6.4	1.21	11.0	15 18.2		12	54.4	-7 19.1	-1.2718	0.5704	0.1238	-56-75
18 Leonis	5.8	1.07	10.2	12 9.8	6	3	54.5	+7 9.3	-0.0436	0.5724	0.1447	+32-32
19 Leonis	6.4	1.06	10.1	11 55.3		4	22.1	+7 36.0	+0.1360	0.5725	0.1453	+43-22
R Leonis (<i>var.</i>)	4.6	+1.06	-10.1	+11 47.0		4	25.4	+7 39.2	+0.2699	0.5725	-0.1454	+51-15
A Leonis	4.6	0.97	9.5	10 22.4		13	20.4	-7 44.7	+0.3637	0.5736	0.1565	+57-11
44 Leonis	5.9	0.91	8.9	9 10.5		20	54.6	-0 26.7	+0.3627	0.5746	0.1650	+57-12
45 Leonis	5.8	0.90	9.1	10 9.2		21	56.9	+0 33.4	-0.8011	0.5748	0.1661	-10-80
ρ Leonis	3.8	0.88	8.9	9 42.1	7	0	11.8	+2 43.4	-0.7185	0.5751	0.1685	-5-81
49 Leonis	5.7	+0.87	-8.7	+9 2.8		1	10.2	+3 39.8	-0.2204	0.5753	-0.1695	+23-45
37 Sextantis	6.3	0.85	8.0	6 46.6		5	58.8	+8 18.1	+1.2426	0.5759	0.1742	+90+49
56 Leonis	6.1	0.82	7.7	6 35.7		10	17.0	-11 32.9	+0.6661	0.5766	0.1780	+84+4
c Leonis	5.1	0.81	7.6	6 30.8		12	19.7	-9 34.7	+0.3813	0.5769	0.1797	+58-12
x Leonis	4.7	0.77	-7.7	+7 45.0		14	10.8	-7 47.6	-1.1945	0.5772	0.1812	-41-83
NEW MOON.												
130 B. Libræ	5.9	+1.05	+3.6	-12 5.7	12	1	45.9	-0 13.4	-1.2075	0.5996	-0.1400	-50-90
γ Libræ	4.0	1.12	3.8	14 32.0		6	23.3	+4 13.2	+0.5663	0.6002	0.1326	+64-3
190 B. Libræ	6.5	1.15	4.0	14 47.8		9	31.7	+7 14.3	+0.4188	0.6005	0.1274	+53-12
η Libræ	5.5	+1.16	+3.9	-15 25.7		9	47.2	+7 29.1	+1.0100	0.6005	-0.1270	+75+26
195 B. Libræ	6.2	1.16	4.7	13 54.0		12	48.7	+10 23.5	-0.8757	0.6008	0.1218	-23-90
202 B. Libræ	6.4	1.18	4.8	14 10.4		14	38.1	-11 51.3	-0.8262	0.6009	0.1186	-20-90
203 B. Libræ	6.2	1.19	4.8	14 36.2		14	45.3	-11 44.4	-0.4143	0.6010	0.1184	+4-62
48 Libræ	4.6	1.19	5.0	14 3.4		15	24.7	-11 6.6	-1.0330	0.6010	0.1173	-35-90
49 Libræ	5.4	+1.19	+4.3	-16 18.4		16	15.5	-10 17.7	+1.0958	0.6010	-0.1157	+74+33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.		
		$\Delta\alpha$	$\Delta\delta$										
		s	"	° ' "	d h m	h m				°	°		
91 B. Scorpii	6.1	1.26	+ 5.7	-14 39.3	12 22 25.1	- 4 22.6	-1.2200	0.6013	-0.1046	-55	-90		
ϕ Ophiuchi	4.4	1.33	6.0	16 26.6	13 4 27.6	+ 1 25.6	-0.0408	0.6013	0.0931	+22	-37		
24 Scorpii	5.0	1.39	6.2	17 35.6	8 35.1	+ 5 23.5	+0.7366	0.6011	0.0851	+73	+ 7		
78 B. Ophiuchi	6.5	1.44	7.2	16 41.0	14 20.0	+10 54.9	-0.6286	0.6006	0.0737	-12	-82		
90 B. Ophiuchi	6.5	1.46	6.8	18 7.7	15 47.4	-11 41.2	+0.7121	0.6004	0.0708	+72	+ 6		
125 B. Ophiuchi	6.2	+1.49	+ 7.5	-17 30.4	19 10.9	- 8 25.7	-0.1389	0.6000	-0.0640	+13	-43		
164 B. Ophiuchi	6.0	1.54	8.1	17 40.5	23 49.1	- 3 58.3	-0.2450	0.5993	0.0545	+ 7	-50		
192 B. Ophiuchi	6.3	1.58	8.1	18 22.4	14 14.8	- 2 10.0	+0.3587	0.5989	0.0507	+42	-15		
305 B. Ophiuchi	6.3	1.71	9.4	18 47.2	14 14.8	+ 9 53.7	+0.3052	0.5959	0.0248	+36	-17		
64 B. Sagittarii	6.1	1.79	10.4	18 41.0	22 10.9	- 6 28.5	+0.0685	0.5933	0.0086	+20	-31		
6 B. Scuti	5.9	+1.78	+10.9	-17 23.9	22 53.0	- 5 47.9	-1.2460	0.5931	-0.0071	-68	-86		
52 G. Sagittarii	6.4	1.80	10.5	18 29.4	22 59.0	- 5 42.2	-0.1353	0.5930	0.0069	+ 9	-43		
17 II ¹ . Sagittarii	6.4	1.81	10.5	18 38.8	23 29.3	- 5 13.0	+0.0224	0.5929	0.0059	+17	-34		
Y Sagittarii (var.)	5.4	1.82	10.6	18 53.6	15 0 34.2	- 4 10.6	+0.2671	0.5924	-0.0037	+31	-20		
85 B. Sagittarii	6.0	1.84	11.2	17 50.7	3 15.8	- 1 35.2	-0.8048	0.5915	+0.0017	-30	-90		
95 B. Sagittarii	5.7	+1.86	+10.9	-18 46.5	4 10.4	- 0 42.6	+0.1479	0.5911	+0.0036	+24	-26		
100 B. Sagittarii	5.0	1.86	11.1	18 27.2	4 41.2	- 0 13.0	-0.1791	0.5909	0.0046	+ 6	-46		
171 B. Sagittarii	6.1	2.01	12.1	19 21.3	17 45.4	-11 38.3	+0.9777	0.5853	0.0302	+71	+25		
173 B. Sagittarii	6.4	2.01	12.2	19 12.7	17 46.9	-11 36.8	+0.8309	0.5853	0.0303	+71	+14		
187 B. Sagittarii	6.4	2.02	12.5	18 51.3	19 28.2	- 9 59.3	+0.5173	0.5845	0.0335	+52	- 6		
190 B. Sagittarii	5.4	+2.03	+12.4	-19 24.5	19 56.3	- 9 32.2	+1.1048	0.5843	+0.0344	+71	+36		
d Sagittarii	5.0	2.07	12.8	19 5.3	23 52.7	- 5 44.6	+0.9258	0.5824	0.0418	+71	+21		
ρ Sagittarii	4.0	2.07	13.4	17 59.4	16 1 36.0	- 4 5.0	-0.1348	0.5816	0.0450	+12	-43		
45 Sagittarii	6.0	2.08	13.2	18 26.9	1 39.8	- 4 1.4	+0.3428	0.5815	0.0451	+40	-15		
266 B. Sagittarii	6.1	2.15	13.6	19 1.2	7 52.0	+ 1 57.2	+1.2532	0.5784	0.0563	+71	+57		
267 B. Sagittarii	5.8	+2.15	+13.8	-18 24.0	8 8.5	+ 2 13.1	+0.6238	0.5782	+0.0567	+63	+ 1		
31 B. Capricorni	6.4	2.34	16.1	15 59.6	17 6 46.0	+ 0 2.6	0.1761	0.5661	0.0938	+15	-46		
27 G. Capricorni	6.2	2.34	16.6	15 18.6	7 49.5	+ 1 3.9	-0.7945	0.5655	0.0953	-20	-90		
47 B. Capricorni	6.2	2.38	16.2	16 47.2	9 48.6	+ 2 58.9	+0.9532	0.5644	0.0982	+74	+22		
τ Capricorni	5.2	2.38	16.9	15 13.3	11 30.8	+ 4 37.6	-0.5286	0.5635	0.1007	- 4	-71		
61 B. Capricorni	5.9	+2.39	+16.6	-16 23.7	12 4.6	+ 5 10.2	+0.7666	0.5631	+0.1015	+74	+ 9		
95 B. Capricorni	5.9	2.45	17.5	14 46.6	20 21.9	-10 49.4	-0.0546	0.5586	0.1128	+24	-38		
53 B. Aquarii	6.5	2.52	18.2	13 31.0	18 4 22.8	- 3 4.5	-0.4482	0.5544	0.1229	+ 3	-64		
18 Aquarii	5.5	2.55	18.5	13 12.3	8 13.1	+ 0 38.3	-0.3020	0.5524	0.1274	+12	-53		
λ Capricorni	5.5	2.63	19.2	11 43.0	18 50.5	+10 55.0	-0.4801	0.5471	0.1388	+ 3	-66		
151 B. Capricorni	6.1	+2.64	+18.9	-13 4.6	20 20.6	-11 37.9	+1.1887	0.5464	+0.1402	+77	+42		
96 B. Aquarii	6.5	2.65	19.6	10 40.2	22 14.8	- 9 47.2	-1.1260	0.5456	0.1421	-39	-90		
150 B. Aquarii	6.0	2.73	20.1	9 25.1	19 9 35.8	+ 1 12.2	-0.8062	0.5405	0.1520	-14	-90		
167 G. Aquarii	6.3	2.81	20.3	8 17.5	20 15.1	+11 31.7	-0.3637	0.5363	0.1598	+13	-57		
213 B. Aquarii	6.5	2.82	20.2	8 42.5	22 36.1	-10 11.6	+0.4653	0.5355	0.1613	-62	- 9		
67 Aquarii	6.4	+2.82	+20.5	- 7 21.6	22 41.9	-10 6.0	-0.9810	0.5354	+0.1614	-24	-90		
λ Aquarii	3.8	2.85	20.3	7 59.0	20 3 24.9	- 5 31.4	+0.4629	0.5337	0.1642	+62	- 9		
78 Aquarii	6.3	2.86	20.4	7 36.5	4 24.3	- 4 33.9	+0.2178	0.5334	0.1647	+46	-23		
81 Aquarii	6.4	2.88	20.3	7 28.2	7 51.8	- 1 12.6	+0.6400	0.5323	0.1666	+78	0		
82 Aquarii	6.4	2.89	20.4	6 58.9	8 26.9	- 0 38.6	+0.2077	0.5322	0.1669	+46	-23		
URANUS	6.1	...	...	- 6 59.8	10 31.0	+ 1 21.7	+0.5708	0.5326	+0.1684	+72	- 3
ϕ Aquarii	4.4	+2.93	+20.2	6 27.5	14 27.3	+ 5 11.0	+0.6494	0.5304	0.1697	+79	+ 1		
96 Aquarii	5.7	2.96	20.5	5 32.4	17 3.1	+ 7 42.1	+0.0891	0.5297	0.1708	+39	-30		
316 B. Aquarii	6.5	2.97	20.6	4 20.0	17 29.8	+ 8 8.1	-1.1520	0.5296	0.1709	-37	-90		
317 B. Aquarii	6.3	2.94	20.2	6 19.4	17 43.3	+ 8 21.1	+1.0587	0.5295	0.1710	+84	+28		
337 B. Aquarii	6.4	+2.99	+20.2	- 4 56.8	22 16.2	-11 14.0	+0.3376	0.5284	+0.1726	+55	-16		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.								Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.			Hour Angle, H		Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d	h	m	h	m					
342 B. Aquarii	6.5	+3.00	+20.3	- 4 30.2	20	23	17.9	-10 14.2	+0.0299	0.5281	+0.1729	+36	-33	
20 Piscium	5.6	3.05	20.3	3 11.0	21	7	48.8	-1 58.3	+0.0694	0.5263	0.1752	+39	-31	
24 Piscium	6.1	3.06	20.0	3 34.7		10	24.5	+0 32.8	+0.9565	0.5259	0.1757	+87	+20	
80 B. Piscium	6.3	3.12	20.1	0 55.5		16	44.9	+6 42.0	-0.8386	0.5249	0.1766	-12	-90	
10 Ceti	6.4	3.18	19.4	0 28.2	22	4	3.7	-6 18.7	+0.6620	0.5236	0.1770	+83	+2	
155 B. Piscium	6.5	+3.27	+18.6	+2 58.3		17	3.6	+6 18.6	-0.8429	0.5230	+0.1755	-13	-88	
77 Piscium	6.4	3.32	17.9	4 30.2	23	0	42.7	-10 15.6	-1.2002	0.5230	0.1738	-41	-86	
f Piscium	5.3	3.31	17.2	3 12.8		7	2.4	-4 6.8	+1.3211	0.5231	0.1718	+83	+60	
μ Piscium	5.0	3.39	16.6	5 45.1		13	32.4	+2 11.8	-0.3815	0.5235	0.1693	+14	-57	
39 B. Arietis	6.5	3.44	14.2	7 22.2	24	7	44.0	-4 8.0	+0.8229	0.5254	0.1598	+90	+13	
64 Ceti	5.8	+3.45	+13.7	+8 12.8		11	7.7	-0 50.3	+0.4253	0.5260	+0.1576	+62	-9	
ξ^1 Ceti	4.5	3.46	13.7	8 29.4		11	58.8	-0 0.7	+0.2529	0.5261	0.1570	+50	-19	
ξ Arietis	5.5	3.50	12.7	10 16.0		18	6.7	+5 56.5	-0.7712	0.5270	0.1527	-8	-80	
25 Arietis	6.5	3.48	12.4	9 51.6		19	27.9	+7 15.3	-0.1148	0.5273	0.1517	+28	-38	
389 B. Ceti	6.3	3.48	12.4	9 13.6		20	35.9	+8 21.3	+0.7622	0.5275	0.1508	+90	+11	
85 Ceti	6.3	+3.51	+11.4	+10 25.0	25	3	15.4	-9 11.2	+0.4242	0.5288	+0.1455	+62	-8	
38 Arietis	5.2	3.55	11.0	12 7.5		4	30.6	-7 58.1	-1.2935	0.5290	0.1444	-58	-78	
μ Ceti	4.4	3.51	11.2	9 47.6		4	31.0	-7 57.7	+1.3014	0.5290	0.1444	+83	+62	
147 B. Arietis	5.8	3.56	9.1	12 53.6		15	30.2	+2 41.9	-0.6139	0.5313	0.1344	+1	-70	
8 B. Tauri	6.2	3.53	7.7	12 21.6	26	0	32.8	+11 28.2	+1.1542	0.5333	0.1252	+90	+43	
f Tauri	4.3	+3.53	+7.1	+12 40.5		3	56.0	-9 14.8	+1.2206	0.5342	+0.1216	+90	+52	
30 B. Tauri	6.4	3.58	6.2	15 10.8		7	23.5	-5 53.5	-1.1504	0.5350	0.1177	-38	-75	
179 B. Tauri	5.9	3.53	3.6	14 57.5	22	19.5	+8 35.1	+0.7236	0.5387	0.0998	+90	+15		
48 Tauri	6.3	3.52	2.8	15 12.6	27	2	19.0	-11 32.8	+0.8325	0.5396	0.0947	+90	+22	
γ Tauri	3.9	3.52	2.4	15 26.6		4	17.8	-9 37.7	+0.7582	0.5402	0.0921	+90	+18	
δ Tauri	3.9	+3.55	+1.8	+17 21.8		5	49.0	-8 9.3	-1.2336	0.5405	+0.0901	-51	-73	
63 Tauri	5.7	3.53	1.9	16 36.0		6	4.0	-7 54.8	-0.3632	0.5406	0.0898	+15	-46	
64 Tauri	4.9	3.55	1.7	17 16.0		6	23.4	-7 36.0	-1.0753	0.5406	0.0894	-32	-73	
70 Tauri	6.4	3.51	1.8	15 46.0		7	9.7	-6 51.1	+0.6579	0.5408	0.0883	+86	+12	
71 Tauri	4.6	3.50	1.8	15 26.7		7	31.3	-6 30.2	+1.0461	0.5409	0.0878	+90	+38	
75 Tauri	5.2	+3.50	+1.6	+16 11.3		8	32.6	-5 30.8	+0.3102	0.5412	+0.0864	+54	-7	
θ^1 Tauri	4.2	3.50	1.6	15 47.6		8	36.7	-5 26.8	+0.7553	0.5412	0.0864	+90	+18	
θ^2 Tauri	3.6	3.50	1.6	15 42.1		8	39.4	-5 24.2	+0.8602	0.5412	0.0863	+90	+25	
80 Tauri	5.8	3.49	1.5	15 28.3		9	23.1	-4 41.9	+1.1780	0.5414	0.0853	+90	+51	
264 B. Tauri	4.8	3.50	1.4	16 1.7		9	35.0	-4 30.3	+0.5777	0.5414	0.0850	+76	+8	
81 Tauri	5.5	+3.49	+1.4	+15 31.6		9	38.0	-4 27.4	+1.1388	0.5415	+0.0850	+90	+47	
85 Tauri	6.0	3.49	1.3	15 41.3		10	13.6	-3 52.9	+1.0090	0.5416	0.0842	+90	+36	
275 B. Tauri	6.5	3.49	1.1	16 9.8		11	5.5	-3 2.7	+0.5545	0.5418	0.0830	+74	+7	
α Tauri (<i>Aldebar.</i>)	1.1	3.49	0.7	16 21.4		12	12.3	-1 58.0	+0.4323	0.5421	0.0815	+63	0	
89 Tauri	5.8	3.48	0.8	15 52.8		13	18.2	-0 54.1	+1.0479	0.5424	0.0799	+90	+39	
σ^2 Tauri	4.9	+3.47	+0.7	+15 46.0		13	51.1	-0 22.2	+1.2173	0.5425	+0.0792	+90	+56	
318 B. Tauri	5.7	3.44	-1.2	17 2.0	22	38.2	+8 8.2	+0.4539	0.5446	0.0666	+65	+3		
m Tauri	5.0	3.47	2.3	18 32.5	28	3	27.6	-11 11.6	-0.9100	0.5457	0.0595	-19	-72	
111 Tauri	5.1	3.36	3.5	17 18.7		11	38.6	-3 16.3	+0.8853	0.5475	0.0471	+90	+30	
115 Tauri	5.3	3.34	3.9	17 53.8		12	57.5	-1 59.9	+0.3013	0.5478	0.0451	+54	-3	
117 Tauri	6.0	+3.32	-3.8	+17 10.5		13	22.8	-1 35.4	+1.1159	0.5479	+0.0444	+90	+49	
119 Tauri	4.9	3.34	4.5	18 32.2		15	21.5	+0 19.4	-0.3014	0.5483	0.0414	+18	-37	
120 Tauri	5.6	3.33	4.6	18 29.1		15	59.2	+0 55.9	-0.2187	0.5484	0.0404	+23	-32	
130 Tauri	5.6	3.25	5.5	17 42.0		22	36.8	+7 20.7	+0.8787	0.5498	0.0299	+90	+32	
57 Orionis	5.8	3.26	6.6	19 44.0	29	2	8.3	+10 45.5	-1.2622	0.5504	0.0243	-61	-71	
64 Orionis	5.1	+3.22	-7.3	+19 41.5		6	9.5	-9 21.3	-1.1290	0.5512	+0.0178	-39	-71	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$								
		^s	["]	[°] ['] [°]	^d ^h ^m	^h ^m				[°]	[°]
68 Orionis	5.7	+3.18	-8.0	+19 48.4	29 10 11.5	-5 27.1	-1.1959	0.5519	+0.0112	-47	-71
19 B. Geminorum	6.2	3.15	7.8	18 42.0	10 55.8	-4 44.3	+0.0258	0.5520	0.0100	+36	-15
124 II ¹ Orionis	5.7	3.13	7.6	17 55.6	11 22.5	-4 18.4	+0.8766	0.5521	0.0093	+90	+34
71 Orionis	5.1	3.15	8.1	19 10.9	11 32.0	-4 9.3	-0.4967	0.5521	0.0090	+7	-48
292 B. Orionis	6.5	3.09	8.0	17 47.9	14 38.4	-1 9.0	+1.0377	0.5527	+0.0039	+90	+46
26 Geminorum	5.2	+2.97	-9.5	+17 43.1	30 0 26.9	+8 20.1	+1.0793	0.5542	-0.0123	+90	+49
74 B. Geminorum	6.2	2.96	10.0	18 16.5	2 45.7	+10 34.4	+0.4393	0.5545	0.0162	+64	+7
110 B. Geminorum	6.2	2.86	10.8	17 51.8	9 45.2	-6 40.1	+0.7321	0.5554	0.0279	+90	+23
162 B. Geminorum	5.7	2.67	12.2	17 14.9	23 21.0	+6 28.5	+0.8599	0.5569	0.0505	+90	+29
<i>f</i> Geminorum	5.3	2.63	12.7	17 50.9	31 2 52.6	+9 53.1	+0.0239	0.5572	0.0563	+36	-20
<i>g</i> Geminorum	5.0	+2.60	-13.4	+18 41.7	5 55.8	-11 9.8	-1.0677	0.5575	-0.0613	-32	-72
2 B. Cancri	6.0	2.50	13.2	16 43.4	11 39.2	-5 38.0	+0.6736	0.5580	0.0706	+89	+15
3 Cancri	5.7	2.49	13.6	17 31.0	12 40.9	-4 38.3	-0.2509	0.5581	0.0723	+21	-37
5 Cancri	5.9	2.48	13.3	16 39.9	13 1.3	-4 18.7	+0.6377	0.5581	0.0729	+83	+13
ζ Cancri (<i>mean</i>)	4.7	+2.42	-14.2	+17 52.6	17 54.8	+0 25.0	-1.0350	0.5585	-0.0807	-29	-73

NOVEMBER.

<i>d</i> ² Cancri	6.2	+2.31	-14.5	+17 17.8	1 0 10.2	+6 27.7	-0.9480	0.5590	-0.0905	-22	-73
90 B. Cancri	6.3	2.24	14.1	15 34.6	4 53.4	+11 1.3	+0.4379	0.5594	0.0979	+64	-1
54 Cancri	6.3	+2.14	-14.4	+15 38.0	11 41.6	-6 24.3	-0.3229	0.5598	-0.1081	+17	-45
<i>o</i> ¹ Cancri	5.1	2.11	14.6	15 36.9	14 31.5	-3 40.1	-0.6148	0.5601	0.1123	0	-67
<i>o</i> ² Cancri	5.7	2.11	14.7	15 52.4	14 40.6	-3 31.3	-0.9051	0.5601	0.1125	-18	-75
81 Cancri	6.4	1.98	14.5	15 18.2	21 24.2	+2 58.6	-1.0890	0.5606	0.1221	-32	-75
π Cancri	5.6	1.98	14.8	15 15.5	22 43.3	+4 15.0	-1.2024	0.5607	0.1240	-44	-75
18 Leonis	5.8	+1.78	-13.9	+12 9.7	2 12 53.3	-6 4.0	+0.1469	0.5621	-0.1429	+44	-22
19 Leonis	6.4	1.77	13.8	11 55.3	13 21.8	-5 36.4	+0.3288	0.5621	0.1435	+55	-12
<i>R</i> Leonis (<i>var.</i>)	4.6	1.78	13.8	11 47.0	13 25.2	-5 33.1	+0.4645	0.5621	0.1435	+65	-4
ν Leonis	5.0	1.71	14.1	12 48.5	18 14.1	-0 54.1	-1.3049	0.5627	0.1494	-61	-76
<i>A</i> Leonis	4.6	1.66	13.3	10 22.3	22 37.6	+3 20.4	+0.5514	0.5632	0.1546	+72	-1
44 Leonis	5.9	+1.57	-12.7	+9 10.4	3 6 26.6	+10 53.4	+0.5418	0.5643	-0.1632	+71	-2
45 Leonis	5.8	1.55	13.0	10 9.1	7 30.8	+11 55.3	-0.6395	0.5645	0.1643	0	-75
ρ Leonis	3.8	1.52	12.8	9 42.0	9 50.0	-9 50.3	-0.5583	0.5649	0.1666	+4	-69
49 Leonis	5.7	1.51	12.5	9 2.7	10 50.2	-8 52.1	-0.0546	0.5650	0.1676	+32	-35
56 Leonis	6.1	1.41	11.4	6 35.6	20 14.0	+0 12.1	+0.8312	0.5667	0.1763	+90	+14
<i>c</i> Leonis	5.1	+1.39	-11.3	+6 30.7	22 20.3	+2 14.1	+0.5398	0.5671	-0.1781	+71	-4
χ Leonis	4.7	1.34	11.6	7 45.0	4 0 14.7	+4 4.4	-1.0585	0.5676	0.1796	-28	-83
σ Leonis	4.1	1.29	10.8	6 26.9	7 23.4	+10 58.2	-1.0375	0.5692	0.1848	-26	-84
80 Leonis	6.4	1.29	10.0	4 16.9	9 28.3	-11 1.2	+0.7664	0.5697	0.1862	+90	+9
89 Leonis	5.7	1.25	9.6	3 29.1	13 14.3	-7 23.1	+0.8617	0.5706	0.1884	+90	+14
β Virginis	3.8	+1.25	-8.9	+2 11.8	20 22.2	-0 30.4	+0.7965	0.5726	-0.1920	+90	+10
27 B. Virginis	6.5	1.18	8.0	0 57.4	5 0 3.0	+3 2.7	+1.3265	0.5737	0.1934	+82	+61
10 Virginis	6.2	1.13	8.2	+2 19.7	4 40.1	+7 29.9	-0.9412	0.5751	0.1949	-19	-88
13 Virginis	5.9	1.13	7.1	-0 21.7	8 33.3	+11 14.8	+0.9801	0.5764	0.1958	+90	+22
η Virginis	4.0	1.12	7.1	0 14.5	9 5.5	+11 45.8	+0.7550	0.5766	0.1959	+90	+7
γ Virginis (<i>mean</i>)	2.9	+1.03	-6.0	-1 1.7	18 26.7	-3 13.3	-0.3012	0.5799	-0.1966	+18	-53
38 Virginis	6.1	1.04	5.1	3 8.2	23 20.0	+1 29.3	+0.8227	0.5817	0.1963	+87	+11
<i>k</i> Virginis	5.7	1.04	4.8	3 23.9	6 2 3.9	+4 7.2	+0.5449	0.5828	0.1958	+71	-5
46 Virginis	6.1	+1.03	-4.8	-2 57.4	2 27.8	+4 30.3	+0.0305	0.5830	-0.1958	+36	-33

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	α'	γ'	N.	S.
		$\Delta\alpha$	$\Delta\delta$		d h m	h m					
125 B. Ophiuchi	6.2	+1.24	+7.6	17 30.4	10 4 53.0	+3 4.5	-0.2883	0.6109	-0.0668	+6	-53
164 B. Ophiuchi	6.0	1.26	8.1	17 40.5	9 21.7	+7 22.3	-0.4003	0.6104	0.0571	-1	-61
192 B. Ophiuchi	6.3	1.28	8.2	18 22.4	11 10.4	+9 6.6	+0.1910	0.6101	0.0532	+31	-24
305 B. Ophiuchi	6.3	1.37	9.4	18 47.2	23 16.6	+3 16.5	+0.1193	0.6074	0.0267	+25	-28
39 G. Sagittarii	6.3	1.42	9.7	19 51.3	11 5 14.3	+2 26.9	+1.0682	0.6055	0.0137	+71	+32
64 B. Sagittarii	6.1	+1.42	+10.2	-18 41.0	6 55.4	+4 3.9	-0.1243	0.6049	-0.0100	+9	-43
52 G. Sagittarii	6.4	1.43	10.3	18 29.4	7 41.8	+4 48.5	-0.3257	0.6016	0.0083	-2	-56
17 H. Sagittarii	6.4	1.44	10.4	18 38.8	8 11.0	+5 16.4	-0.1712	0.6045	0.0072	+7	-45
Y Sagittarii (var.)	5.4	1.44	10.4	18 53.6	9 13.5	+6 16.5	+0.0680	0.6041	-0.0050	+20	-31
85 B. Sagittarii	6.0	1.45	10.9	17 50.7	11 49.2	+8 45.9	-0.9894	0.6030	+0.0006	-42	-90
95 B. Sagittarii	5.7	+1.48	+10.7	-18 46.5	12 41.8	+9 36.6	-0.0537	0.6026	+0.0025	+12	-38
100 B. Sagittarii	5.0	1.47	10.8	18 27.2	13 11.5	+10 5.1	-0.3758	0.6024	0.0035	-5	-59
171 B. Sagittarii	6.1	1.59	11.7	19 21.3	12 1 47.4	+1 48.5	+0.7473	0.5962	0.0299	+71	+8
173 B. Sagittarii	6.4	1.59	11.8	19 12.7	1 48.8	+1 47.1	+0.6029	0.5962	0.0300	+58	-1
187 B. Sagittarii	6.4	1.60	12.0	18 51.3	3 26.5	-0 13.2	+0.2928	0.5953	0.0333	+36	-18
190 B. Sagittarii	5.4	+1.60	+11.9	-19 24.5	3 53.6	+0 12.8	+0.8702	0.5951	+0.0342	+71	+17
d Sagittarii	5.0	1.64	12.3	19 5.3	7 41.8	+3 52.3	+0.6905	0.5929	0.0418	+68	+5
226 B. Sagittarii	6.4	1.65	12.3	19 22.6	9 19.1	+5 25.9	+1.0550	0.5920	0.0419	+71	+31
p Sagittarii	4.0	1.64	12.7	17 59.4	9 21.5	+5 28.2	-0.3547	0.5920	0.0450	0	-58
45 Sagittarii	6.0	1.65	12.5	18 26.9	9 25.2	+5 31.7	+0.1152	0.5919	0.0451	+26	-28
266 B. Sagittarii	6.1	+1.70	+12.8	-19 1.2	15 24.7	+11 17.6	+1.0062	0.5882	+0.0566	+71	+27
267 B. Sagittarii	5.8	1.70	13.1	18 24.0	15 40.7	+11 33.1	+0.3864	0.5881	0.0571	+44	-13
31 B. Capricorni	6.4	1.89	15.1	15 59.6	13 36.8	+8 40.9	-0.4158	0.5736	0.0948	+2	-62
27 G. Capricorni	6.2	1.89	15.3	15 18.6	14 38.5	+9 40.4	-1.0264	0.5728	0.0964	+36	-90
47 B. Capricorni	6.2	1.93	14.9	16 47.2	16 34.4	+11 32.2	+0.6974	0.5715	0.0994	+73	+5
τ Capricorni	5.2	+1.93	+15.6	-15 13.3	18 13.9	-10 51.8	-0.7657	0.5704	+0.1018	-18	-90
61 B. Capricorni	5.9	1.94	15.3	16 23.7	18 46.8	-10 20.1	+0.5126	0.5700	0.1026	+58	-6
94 B. Capricorni	5.7	2.02	15.5	16 19.4	2 23.2	-2 59.6	+1.2656	0.5648	0.1134	+74	+55
95 B. Capricorni	5.9	2.01	16.0	14 46.6	2 51.9	-2 31.9	-0.3004	0.5645	0.1141	-10	-54
53 B. Aquarii	6.5	2.09	16.7	13 31.1	10 42.3	+5 2.5	-0.6909	0.5593	0.1242	-11	-90
18 Aquarii	5.5	+2.12	+16.9	-13 12.3	14 28.0	+8 40.6	-0.5465	0.5568	+0.1287	-2	-72
λ Capricorni	5.5	2.22	17.5	11 43.0	15 0 54.3	-5 13.8	-0.7220	0.5503	0.1401	-10	-90
151 B. Capricorni	6.1	2.24	17.1	13 4.7	2 23.1	+3 47.9	+0.9324	0.5494	0.1415	+77	+19
e Aquarii	5.4	2.33	17.5	11 56.4	12 25.0	+5 54.7	+1.1917	0.5436	0.1507	+79	+41
150 B. Aquarii	6.0	2.36	18.3	9 25.1	15 28.2	+8 52.0	-1.0412	0.5420	0.1532	-30	-90
167 G. Aquarii	6.3	+2.47	+18.5	-8 17.6	16 2 2.0	-4 54.0	-0.5956	0.5366	+0.1609	0	-76
213 B. Aquarii	6.5	2.49	18.4	8 42.6	4 22.0	-2 38.3	+0.2306	0.5356	0.1624	+46	-22
67 Aquarii	6.4	2.49	18.8	7 21.7	4 27.9	-2 32.6	-1.2078	0.5356	0.1624	-44	-90
λ Aquarii	3.8	2.53	18.5	7 59.1	9 9.2	+2 0.2	+0.2325	0.5335	0.1652	+47	-22
78 Aquarii	6.3	2.54	18.5	7 36.5	10 8.4	+2 57.6	-0.0105	0.5331	0.1657	+33	-36
81 Aquarii	6.4	+2.57	+18.5	-7 28.2	13 35.1	+6 18.0	+0.4131	0.5317	+0.1675	+59	-12
82 Aquarii	6.4	2.58	18.6	6 59.0	14 10.1	+6 51.9	-0.0167	0.5315	0.1678	+33	-36
URANUS	6.1	...	...	7 9.3	15 22.5	+8 2.1	+0.3732	0.5314	0.1685	+56	-15
ϕ Aquarii	4.4	2.64	18.4	6 27.6	20 9.5	-11 19.5	+0.4297	0.5292	0.1705	+61	-11
96 Aquarii	5.7	2.68	18.7	5 32.4	22 45.1	-8 48.6	-0.1257	0.5283	0.1716	+27	-42
317 B. Aquarii	6.3	+2.66	+18.4	-6 19.4	23 25.2	-8 9.7	+0.8415	0.5281	+0.1718	+84	+12
337 B. Aquarii	6.4	2.73	18.5	4 56.8	3 58.0	-3 44.8	+0.1283	0.5267	0.1735	+42	-28
342 B. Aquarii	6.5	2.74	18.6	4 30.2	4 59.8	-2 44.9	-0.1771	0.5264	0.1738	+25	-45
20 Piscium	5.6	2.82	18.7	3 11.1	13 31.2	+5 31.5	-0.1264	0.5241	0.1760	+28	-42
24 Piscium	6.1	2.84	18.4	3 34.7	16 7.3	+8 3.1	+0.7629	0.5236	0.1765	+87	+7
80 B. Piscium	6.3	+2.92	+18.7	-0 55.5	22 28.9	-9 46.5	-1.0200	0.5223	+0.1773	-25	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"		d h m	h m				°	'
10 Ceti	6.4	+3.03	+18.0	0 28.2	18 9 50.4	+1 15.3	+0.4978	0.5208	+0.1778	+67	- 8
155 B. Piscium	6.5	3.17	17.6	2 58.3	22 51.4	-10 3.2	-0.9831	0.5200	0.1765	-22	-88
77 Piscium	6.1	3.26	17.1	4 30.2	19 6 36.2	-2 34.6	-1.3256	0.5201	0.1748	-60	-81
f Piscium	5.3	3.28	16.1	3 12.8	12 58.0	+3 36.2	+1.2089	0.5204	0.1730	+90	+42
μ Piscium	5.0	3.39	15.9	5 45.1	19 30.2	+9 57.2	-0.4807	0.5209	0.1706	+ 9	-65
ν Piscium	4.7	+3.40	+15.0	5 6.2	20 1 28.1	-8 15.3	+1.2502	0.5216	+0.1680	+90	+48
39 B. Arietis	6.5	3.53	13.7	7 22.2	13 47.1	+3 42.5	+0.7638	0.5235	0.1614	+90	+10
64 Ceti	5.8	3.56	13.3	8 12.8	17 11.6	+7 1.0	+0.3736	0.5242	0.1593	+58	-12
ξ^1 Ceti	4.5	3.57	13.3	8 29.4	18 3.0	+7 50.9	+0.2030	0.5244	0.1587	+47	-21
ξ Arietis	5.5	3.65	12.6	10 16.0	21 0 12.1	-10 10.8	-0.8076	0.5257	0.1545	-10	-80
25 Arietis	6.5	+3.63	+12.1	9 51.6	1 33.5	-8 51.8	-0.1480	0.5259	+0.1535	+27	-40
389 B. Ceti	6.3	3.64	12.0	9 13.6	2 41.7	-7 45.6	+0.7318	0.5262	0.1527	+90	+ 9
85 Ceti	6.3	3.70	11.1	10 25.0	9 22.0	-1 17.1	+0.4088	0.5278	0.1475	+61	- 9
38 Arietis	5.2	3.75	11.0	12 7.5	10 37.4	-0 3.9	-1.3061	0.5281	0.1464	-60	-77
μ Ceti	4.4	3.71	10.8	9 47.6	10 37.9	-0 3.4	+1.2889	0.5281	0.1464	+86	+59
147 B. Arietis	5.8	+3.82	+ 9.2	12 53.6	21 37.7	+10 36.9	-0.6015	0.5311	+0.1366	+ 2	-69
8 B. Tauri	6.2	3.83	7.5	12 21.6	22 6 40.1	-4 37.0	+1.1867	0.5336	0.1276	+90	+47
f Tauri	4.3	3.85	7.0	12 40.5	10 3.1	-1 20.2	+1.2605	0.5346	0.1239	+89	+57
30 B. Tauri	6.1	3.93	6.4	15 10.8	13 30.2	+2 0.7	-1.1018	0.5356	0.1201	-33	-75
179 B. Tauri	5.9	3.95	3.4	14 57.5	23 4 23.9	-7 33.1	+0.8042	0.5401	0.1023	+90	+19
48 Tauri	6.3	+3.96	+ 2.7	15 12.6	8 22.5	-3 41.9	+0.9217	0.5412	+0.0972	+90	+28
γ Tauri	3.9	3.96	2.2	15 26.6	10 20.9	-1 47.2	+0.8516	0.5418	0.0946	+90	+23
δ Tauri	3.9	4.02	1.9	17 21.8	11 51.7	-0 19.3	-1 1361	0.5423	0.0926	-38	-73
63 Tauri	5.7	4.00	1.9	16 36.0	12 6.6	-0 4.8	-0.2655	0.5423	0.0922	+20	-40
64 Tauri	4.9	4.02	1.8	17 16.0	12 25.9	+0 13.9	-0.9765	0.5424	0.0918	-23	-73
70 Tauri	6.4	+3.97	+ 1.7	15 46.0	13 12.0	+0 58.6	+0.7574	0.5426	+0.0908	+90	+18
71 Tauri	4.6	3.96	1.6	15 26.7	13 33.5	+1 19.4	+1.1462	0.5429	0.0903	+90	+47
75 Tauri	5.2	3.98	1.4	16 11.3	14 34.6	+2 18.6	+0.4127	0.5430	0.0889	+62	- 2
θ^1 Tauri	4.2	3.97	1.4	15 47.6	14 38.6	+2 22.5	+0.8578	0.5430	0.0888	+90	+24
θ^2 Tauri	3.6	3.97	1.4	15 42.1	14 41.3	+2 25.1	+0.9628	0.5430	0.0887	+90	+32
80 Tauri	5.8	+3.96	+ 1.3	15 28.3	15 24.9	+3 7.3	+1.2820	0.5433	+0.0877	+79	+68
264 B. Tauri	4.8	3.98	1.2	16 1.7	15 36.7	+3 18.8	+0.6824	0.5433	0.0875	+90	+14
81 Tauri	5.5	3.96	1.2	15 31.6	15 39.7	+3 21.7	+1.2433	0.5434	0.0874	+90	+59
85 Tauri	6.0	3.97	1.1	15 41.3	16 15.1	+3 56.0	+1.1148	0.5435	0.0866	+90	+44
119 H ¹ . Tauri	6.2	4.02	0.8	17 51.3	17 2.8	+4 42.1	-1.2187	0.5437	0.0855	-48	-73
275 B. Tauri	6.5	+3.98	+ 0.9	16 9.8	17 6.8	+4 46.0	+0.6623	0.5437	+0.0854	+87	+13
α Tauri (<i>Aldebar.</i>)	1.1	3.98	0.5	16 21.4	18 13.3	+5 50.4	+0.5425	0.5440	0.0839	+73	+ 6
89 Tauri	5.8	3.97	+ 0.4	15 52.8	19 18.9	+6 54.0	+1.1601	0.5444	0.0823	+90	+49
318 B. Tauri	5.7	3.98	-1.5	17 2.0	24 4 36.2	-8 6.3	+0.5854	0.5468	0.0690	+77	+10
m Tauri	5.0	4.05	2.6	18 32.5	9 24.1	-3 27.7	-0.7688	0.5480	0.0618	- 9	-72
111 Tauri	5.1	+3.97	- 4.2	17 18.7	17 32.7	+4 25.3	+1.0423	0.5500	+0.0493	+90	+42
115 Tauri	5.3	3.96	4.5	17 53.8	18 51.2	+5 41.3	+0.4607	0.5502	0.0473	+66	+ 5
117 Tauri	6.0	3.94	4.6	17 10.5	19 16.3	+6 5.6	+1.2763	0.5503	0.0466	+75	+71
119 Tauri	4.9	3.97	5.0	18 32.2	21 14.4	+7 59.8	-0.1377	0.5508	0.0435	+27	-28
120 Tauri	5.6	3.97	5.2	18 29.1	21 51.9	+8 36.1	-0.0539	0.5509	0.0425	+32	-23
130 Tauri	5.6	+3.91	- 6.4	17 42.0	25 4 27.7	-9 1.0	+1.0563	0.5522	+0.0319	+90	+45
B. D. +19°1110	6.0	3.95	7.2	19 50.8	6 45.9	-6 47.3	-1.2381	0.5526	0.0282	-54	-71
57 Orionis	5.8	3.94	7.4	19 44.0	7 58.2	-5 37.4	-1.0803	0.5528	0.0262	-33	-71
64 Orionis	5.1	3.92	8.2	19 41.4	11 58.5	-1 44.9	-0.9403	0.5534	0.0196	-22	-71
68 Orionis	5.7	3.90	9.0	19 48.4	15 59.7	+2 8.4	-1.0008	0.5540	0.0130	-26	-71
19 B. Geminorum	6.2	+3.86	- 9.0	18 41.9	16 43.8	+2 51.0	+0.2240	0.5541	+0.0117	+49	- 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"									°	'	d	h	m	h	m	°	'
124 H ¹ . Orionis	5.7	+3.84	- 8.9	+17 55.6	25 17 10.4	+ 3 16.8	+1.0769	0.5512	+0.0110	+90	+48
71 Orionis	5.1	3.86	9.3	19 10.9	17 19.9	+ 3 25.9	-0.2981	0.5512	0.0108	+18	-34
292 B. Orionis	6.5	3.81	9.4	17 47.9	20 25.8	+ 6 25.8	+1.2439	0.5516	+0.0056	+86	+67
74 B. Geminorum	6.2	3.72	11.7	18 16.5	26 8 31.8	- 5 52.2	+0.6637	0.5558	-0.0147	+88	+20
110 B. Geminorum	6.2	3.65	12.8	17 51.7	15 31.4	+ 0 53.6	+0.9680	0.5563	0.0265	+90	+38
162 B. Geminorum	5.7	+3.50	-11.8	+17 14.8	27 5 9.2	- 9 55.9	+1.1154	0.5567	-0.0492	+90	+48
f Geminorum	5.3	3.47	15.1	17 50.8	8 42.0	- 6 30.2	+0.2792	0.5567	0.0551	+52	- 6
g Geminorum	5.0	3.44	16.1	18 41.7	11 46.2	- 3 32.1	-0.8156	0.5567	0.0601	-13	-72
2 B. Cancri	6.0	3.34	16.2	16 43.4	17 32.1	+ 2 2.3	+0.9430	0.5566	0.0695	+90	+32
3 Cancri	5.7	3.34	16.6	17 31.0	18 34.3	+ 3 2.5	+0.0131	0.5566	0.0711	+36	-22
5 Cancri	5.9	+3.33	-16.4	+16 39.9	18 54.8	+ 3 22.2	+0.9084	0.5566	-0.0716	+90	+30
ζ Cancri (<i>mean</i>)	4.7	3.29	17.1	17 52.6	23 51.2	+ 8 8.7	-0.7722	0.5564	0.0795	- 9	-73
d ² Cancri	6.2	3.18	18.0	17 17.8	28 6 10.8	- 9 44.3	-0.6798	0.5562	0.0893	- 3	-70
90 B. Cancri	6.3	3.11	17.8	15 31.6	10 57.8	- 5 6.9	+0.7220	0.5560	0.0965	+90	+15
54 Cancri	6.3	3.01	18.3	15 37.9	17 52.3	+ 1 33.8	-0.0418	0.5556	0.1067	+33	-29
o ¹ Cancri	5.1	+2.98	-18.5	+15 36.8	20 45.1	+ 4 20.9	-0.3353	0.5555	-0.1108	+17	-46
o ² Cancri	5.7	2.98	18.6	15 52.4	20 51.1	+ 4 29.9	-0.6286	0.5555	0.1111	0	-68
81 Cancri	6.4	2.85	18.7	15 18.1	29 3 45.6	+11 7.5	-0.8124	0.5552	0.1206	-11	-75
π Cancri	5.6	2.86	19.0	15 15.4	5 6.3	-11 34.5	0.9269	0.5552	0.1224	-19	-75
18 Leonis	5.8	2.65	18.6	12 9.6	19 36.2	+ 2 26.5	+0.4416	0.5548	0.1410	+64	- 6
19 Leonis	6.4	+2.64	-18.5	+11 55.2	20 5.4	+ 2 54.8	+0.6260	0.5548	-0.1415	+80	+ 5
R Leonis (<i>var.</i>)	4.6	2.64	18.5	11 46.9	20 8.9	+ 2 58.1	+0.7636	0.5548	0.1416	+90	+13
ν Leonis	5.0	2.57	18.9	12 48.4	30 1 5.6	+ 7 45.0	-1.0312	0.5548	0.1474	-26	-78
A Leonis	4.6	2.50	18.2	10 22.2	5 36.6	-11 53.1	+0.8514	0.5548	0.1525	+90	+17
α Leonis (<i>Reg.</i>)	1.3	2.49	18.8	12 20.3	5 49.2	-11 40.8	-1.2456	0.5548	0.1527	-48	-78
44 Leonis	5.9	+2.40	-17.7	+ 9 10.3	13 39.8	- 4 5.9	+0.8397	0.5551	-0.1609	+90	+15
45 Leonis	5.8	2.39	18.0	10 9.0	14 46.2	- 3 1.7	-0.3606	0.5552	0.1620	+15	-54
ρ Leonis	3.8	2.36	17.8	9 41.9	17 9.9	- 0 42.8	-0.2795	0.5553	0.1643	+20	-49
49 Leonis	5.7	+2.34	-17.6	+ 9 2.6	18 12.1	+ 0 17.4	+0.2318	0.5554	-0.1653	+49	-20

DECEMBER.

56 Leonis	6.1	+2.22	-16.5	+ 6 35.5	1 3 55.0	+ 9 40.7	+1.1260	0.5562	-0.1738	+90	+35
c Leonis	5.1	2.20	16.4	6 30.7	6 5.8	+11 47.3	+0.8280	0.5566	0.1755	+90	+13
x Leonis	4.7	2.15	16.8	7 44.9	8 4.3	-10 18.2	-0.7990	0.5568	0.1770	-10	-83
σ Leonis	4.1	+2.08	-16.0	+ 6 26.8	15 28.8	- 3 8.6	-0.7854	0.5580	-0.1822	- 9	-84
80 Leonis	6.4	2.06	15.1	4 16.8	17 38.3	- 1 3.4	+1.0473	0.5583	0.1835	+90	+28
89 Leonis	5.7	2.02	14.7	3 29.0	21 32.9	+ 2 43.2	+1.1396	0.5591	0.1858	+90	+35
β Virginis	3.8	2.00	13.9	2 11.7	2 4 57.2	+ 9 52.5	+1.0634	0.5608	0.1893	+90	+28
10 Virginis	6.2	1.85	13.2	+ 2 19.6	13 34.3	- 5 48.1	-0.7180	0.5632	0.1924	- 5	-88
13 Virginis	5.9	+1.84	-11.8	- 0 21.8	17 36.5	- 1 54.2	+1.2294	0.5645	-0.1934	+90	+44
η Virginis	4.0	1.83	11.8	0 14.5	18 9.9	- 1 21.9	+0.9995	0.5647	0.1935	+90	+23
γ Virginis (<i>mean</i>)	2.9	1.70	10.6	1 1.8	3 52.6	+ 8 0.6	-0.0931	0.5682	0.1946	+30	-40
38 Virginis	6.1	1.70	9.4	3 8.2	8 56.7	-11 5.9	+1.0385	0.5702	0.1944	+87	+26
k Virginis	5.7	1.69	9.0	3 24.0	11 46.6	- 8 22.0	+0.7500	0.5713	0.1939	+87	+ 6
46 Virginis	6.1	+1.68	- 9.1	- 2 57.4	12 11.4	- 7 58.1	+0.2267	0.5715	-0.1939	+48	-23
48 Virginis	6.5	1.67	8.9	3 15.1	13 38.2	- 6 34.4	+0.2409	0.5722	0.1937	+49	-22
65 Virginis	6.0	1.60	7.5	4 31.4	• 22 3.3	+ 1 32.8	-0.1097	0.5760	0.1914	+28	-41
66 Virginis	5.7	1.62	7.4	4 45.8	22 34.9	+ 2 3.2	+0.0287	0.5762	0.1913	+36	-34
72 Virginis	6.1	1.60	6.7	6 4.5	4 1 6.3	+ 4 29.2	+0.8533	0.5775	0.1902	+84	+13
ι Virginis	4.8	+1.58	- 6.7	- 5 51.6	1 46.2	+ 5 7.6	+0.5130	0.5778	-0.1900	+67	- 7

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° ' "	d h m	h m				°	°
80 Virginis	5.6	+1.57	-6.7	-5 0.4	4 3 17.6	+6 35.7	-0.6260	0.5785	-0.1892	0	-79
566 B. Virginis	6.4	1.53	6.3	5 6.8	6 52.1	+10 2.4	-1.1917	0.5803	0.1875	-41	-90
88 Virginis	6.5	1.54	5.7	6 27.3	8 43.6	+11 49.8	-0.2056	0.5813	0.1863	+23	-47
598 B. Virginis	6.1	1.53	5.1	7 40.9	11 32.6	-9 27.4	+0.4885	0.5827	0.1846	+65	-8
623 B. Virginis	6.5	1.52	4.2	8 53.4	15 28.6	-5 40.1	+0.9628	0.5848	0.1819	+82	+21
95 Virginis	5.4	+1.51	-4.1	-8 56.9	16 27.9	-4 43.0	+0.8409	0.5853	-0.1811	+82	+12
13 Libræ	5.7	1.42	0.8	11 35.1	5 12 1.8	-9 53.4	+0.0739	0.5957	0.1615	+35	-31
ξ^2 Libræ	5.6	1.41	-0.8	11 6.0	12 59.7	-8 57.8	-0.5587	0.5962	-0.1603	0	-73
NEW MOON.											
187 B. Sagittarii	6.4	+1.43	+11.5	-18 51.3	9 13 42.2	+11 50.6	+0.1013	0.6052	+0.0318	+24	-30
190 B. Sagittarii	5.4	1.44	11.5	19 24.5	14 8.5	-11 44.2	+0.6705	0.6050	0.0327	+65	+3
195 B. Sagittarii	6.3	1.44	11.4	19 55.4	14 44.0	-11 10.1	+1.2055	0.6047	0.0340	+71	+48
d Sagittarii	5.0	1.45	11.8	19 5.3	17 49.7	-8 11.8	+0.4848	0.6031	0.0405	+50	-8
226 B. Sagittarii	6.4	1.46	11.9	19 22.6	19 24.0	-6 41.1	+0.8411	0.6023	0.0438	+71	+14
ρ Sagittarii	4.0	+1.44	+12.2	-17 59.4	19 26.4	-6 38.8	-0.5503	0.6022	+0.0439	-11	-74
45 Sagittarii	6.0	1.46	12.0	18 26.9	19 29.9	-6 35.5	-0.0866	0.6022	0.0440	+11	-40
266 B. Sagittarii	6.1	1.48	12.3	19 12.0	10 1 18.1	-1 0.9	+0.7892	0.5989	0.0558	+71	+10
267 B. Sagittarii	5.8	1.48	12.5	18 21.0	1 33.5	-0 46.0	+0.1685	0.5987	0.0563	+30	-26
31 B. Capricorni	6.4	1.60	14.1	15 59.6	22 45.4	-4 22.5	-0.6610	0.5844	0.0953	-12	-87
27 G. Capricorni	6.2	+1.60	+14.2	-15 18.7	23 45.1	-3 25.0	-1.2642	0.5836	+0.0969	-63	-85
47 B. Capricorni	6.2	1.63	13.9	16 47.3	11 1 36.9	-1 37.3	+0.4311	0.5823	0.1000	+51	-11
τ Capricorni	5.2	1.63	14.4	15 13.3	3 13.0	-0 4.8	-1.0128	0.5811	0.1025	-35	-90
61 B. Capricorni	5.9	1.63	14.2	16 23.7	3 44.8	+0 25.9	+0.2457	0.5807	0.1034	+39	-21
94 B. Capricorni	5.7	1.70	14.4	16 19.5	11 5.6	+7 30.7	+0.9768	0.5753	0.1145	+74	+23
95 B. Capricorni	5.9	+1.69	+14.8	-14 46.6	11 33.4	+7 57.5	-0.5666	0.5749	+0.1151	-5	-75
29 Capricorni	5.5	1.75	14.7	15 29.3	19 0.4	-8 51.3	+1.0667	0.5694	0.1254	+75	+30
53 B. Aquarii	6.5	1.75	15.2	13 31.1	19 8.0	-8 44.0	-0.9612	0.5692	0.1255	-28	-90
18 Aquarii	5.5	1.79	15.4	13 12.3	22 46.3	-5 13.3	-0.8232	0.5665	0.1301	-18	-90
λ Capricorni	5.5	1.87	15.9	11 43.0	12 8 52.8	+4 32.5	-1.0069	0.5591	0.1418	-29	-90
151 B. Capricorni	6.1	+1.88	+15.5	-13 4.7	10 18.8	+5 55.5	+0.6231	0.5581	+0.1433	+71	0
e Aquarii	5.4	1.98	15.7	11 56.4	20 3.0	-8 39.6	+0.8723	0.5514	0.1526	+79	+15
167 G. Aquarii	6.3	2.11	16.6	8 17.6	13 9 18.6	+4 10.3	-0.8983	0.5431	0.1628	-19	-90
213 B. Aquarii	6.5	2.14	16.4	8 42.6	11 35.3	+6 22.7	-0.0826	0.5417	0.1643	+28	-40
λ Aquarii	3.8	2.19	16.5	7 59.1	16 15.9	+10 54.6	-0.0815	0.5391	0.1670	+29	-40
78 Aquarii	6.3	+2.20	+16.5	-7 36.6	17 13.7	+11 50.5	-0.3218	0.5386	+0.1676	+16	-55
81 Aquarii	6.4	2.23	16.4	7 28.2	20 36.0	-8 53.4	+0.0970	0.5368	0.1693	+39	-30
82 Aquarii	6.4	2.24	16.6	6 59.0	21 10.2	-8 20.3	-0.3282	0.5365	0.1697	+16	-55
h Aquarii	5.4	2.26	16.2	8 6.3	22 27.7	-7 5.2	+1.0944	0.5358	0.1703	+82	+31
URANUS	6.2	...	...	7 4.6	22 38.1	-6 55.1	+0.0213	0.5351	0.1701	+35	-34
ϕ Aquarii	4.4	+2.31	+16.3	-6 27.6	14 3 2.6	-2 38.8	+0.1141	0.5336	+0.1724	+41	29
96 Aquarii	5.7	2.35	16.7	5 32.4	5 35.3	-0 10.7	-0.4353	0.5324	0.1734	+10	-63
317 B. Aquarii	6.3	2.33	16.3	6 19.5	6 14.7	+0 27.4	+0.5227	0.5321	0.1736	+68	-7
337 B. Aquarii	6.4	2.41	16.4	4 56.9	10 42.9	+4 47.6	-0.1823	0.5302	0.1752	+24	-46
342 B. Aquarii	6.5	2.42	16.5	4 30.2	11 43.6	+5 46.4	-0.4846	0.5297	0.1755	+8	-66
20 Piscium	5.6	+2.51	+16.6	-3 11.1	20 7.6	-10 4.6	-0.4305	0.5266	+0.1775	+11	-62
24 Piscium	6.1	2.54	16.3	3 34.7	22 41.7	-7 35.1	+0.4532	0.5258	0.1780	+63	-10
29 Piscium	5.1	2.58	16.0	3 27.1	15 3 18.1	-3 6.8	+1.1384	0.5244	0.1786	+87	+34
80 B. Piscium	6.3	2.63	16.7	0 55.6	4 59.0	-1 28.9	-1.3118	0.5239	0.1788	-57	-86
4 Ceti	6.3	2.62	15.9	2 58.4	6 22.4	-0 7.9	+1.1674	0.5235	0.1789	+88	+37
5 Ceti	6.3	+2.62	+16.0	-2 52.3	6 37.0	+0 6.3	+1.1006	0.5235	+0.1789	+88	+31

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Parallels.		
Name.	Mag.	Red'ns from 1923.0.		Apparent Declination.	Greenwich Mean Time.			Hour Angle, <i>H</i>		<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>
		$\Delta\alpha$	$\Delta\delta$		d	h	m	h	m					
10 Ceti	6.4	+2.76	+16.0	0 28.3	15	16	14.6	+ 9 27.1	+0.2058	0.5213	+0.1791	+47	-24	
155 B. Piscium	6.5	2.94	15.8	+ 2 58.3	16	5	14.6	- 1 55.5	-1.2522	0.5195	0.1776	-46	-88	
<i>f</i> Piscium	5.3	3.08	14.4	3 12.8	19	16.6	+11 42.3	+0.9513	0.5190	0.1741	+90	+20		
μ Piscium	5.0	3.22	14.4	5 45.1	17	1	48.7	- 5 56.8	-0.7220	0.5192	0.1717	- 5	-85	
ν Piscium	4.7	3.24	13.4	5 6.1	7	47.0	- 0 8.8	+1.0145	0.5197	0.1691	+90	+25		
39 B. Arietis	6.5	+3.41	+12.3	+ 7 22.2	20	7.6	+11 50.5	+0.5531	0.5212	+0.1627	+72	- 3		
64 Ceti	5.8	3.45	12.0	8 12.8	23	32.7	- 8 50.3	+0.1706	0.5219	0.1605	+45	-24		
ξ^1 Ceti	4.5	3.48	12.0	8 29.4	18	0	24.2	- 8 0.4	+0.0020	0.5220	0.1600	+35	-33	
ξ Arietis	5.5	3.58	11.6	10 15.9	6	34.5	- 2 0.8	-0.9941	0.5233	0.1559	-23	-80		
25 Arietis	6.5	3.56	11.0	9 51.6	7	56.2	- 0 41.6	-0.3328	0.5236	0.1549	+16	-52		
389 B. Ceti	6.3	+3.58	+10.9	+ 9 13.5	9	4.6	+ 0 24.9	+0.5481	0.5239	+0.1541	+72	- 2		
85 Ceti	6.3	3.66	10.1	10 25.0	15	46.3	+ 6 54.8	+0.2401	0.5255	0.1489	+49	-18		
μ Ceti	4.4	3.68	9.7	9 47.6	17	2.4	+ 8 8.7	+1.1217	0.5259	0.1479	+90	+37		
147 B. Arietis	5.8	3.83	8.5	12 53.6	19	4	4.3	- 5 9.0	-0.7410	0.5290	0.1383	- 6	-78	
8 B. Tauri	6.2	3.89	6.7	12 21.6	13	8.1	+ 3 38.5	+1.0657	0.5319	0.1294	+90	+35		
<i>f</i> Tauri	4.3	+3.93	+ 6.1	+12 40.5	16	31.5	+ 6 55.7	+1.1474	0.5330	+0.1259	+90	+42		
30 B. Tauri	6.4	4.02	6.0	15 10.8	19	59.0	+10 17.0	-1.2032	0.5343	0.1222	-44	-75		
179 B. Tauri	5.9	4.12	2.8	14 57.5	20	10	53.1	+ 0 43.7	+0.7357	0.5395	0.1046	+90	+15	
48 Tauri	6.3	4.15	2.0	15 12.6	14	51.5	+ 4 34.6	+0.8625	0.5409	0.0995	+90	+23		
γ Tauri	3.9	4.17	1.7	15 26.6	16	49.8	+ 6 29.3	+0.7973	0.5416	0.0970	+90	+20		
δ Tauri	3.9	+4.23	+ 1.6	+17 21.8	18	20.4	+ 7 57.0	-1.1826	0.5422	+0.0950	-43	-73		
63 Tauri	5.7	4.21	1.4	16 35.9	18	35.3	+ 8 11.5	-0.3133	0.5423	0.0946	+18	-43		
64 Tauri	4.9	4.23	1.4	17 16.0	18	54.6	+ 8 30.2	-1.0220	0.5424	0.0942	-27	-73		
70 Tauri	6.4	4.19	1.1	15 46.0	19	40.6	+ 9 14.7	+0.7102	0.5426	0.0932	+90	+15		
71 Tauri	4.6	4.18	1.0	15 26.7	20	2.1	+ 9 35.6	+1.0990	0.5428	0.0927	+90	+42		
75 Tauri	5.2	+4.20	+ 0.9	+16 11.3	21	3.0	+10 34.5	+0.3695	0.5431	+0.0913	+59	- 5		
θ^1 Tauri	4.2	4.20	0.8	15 47.6	21	7.1	+10 38.6	+0.8138	0.5432	0.0912	+90	+21		
θ^2 Tauri	3.6	4.20	0.8	15 42.1	21	9.7	+10 41.1	+0.9186	0.5432	0.0912	+90	+28		
80 Tauri	5.8	4.19	0.6	15 28.3	21	53.2	+11 23.2	+1.2390	0.5434	0.0902	+90	+58		
264 B. Tauri	4.8	4.21	0.6	16 1.7	22	5.0	+11 34.6	+0.6411	0.5435	0.0899	+84	+11		
81 Tauri	5.5	+4.20	+ 0.5	+15 31.5	22	8.0	+11 37.5	+1.2009	0.5435	+0.0899	+90	+53		
85 Tauri	6.0	4.20	0.4	15 41.3	22	43.3	-11 48.3	+1.0742	0.5437	0.0890	+90	+40		
119 B. Tauri	6.2	4.27	0.5	17 51.3	23	30.9	-11 2.2	-1.2522	0.5440	0.0880	-54	-73		
275 B. Tauri	6.5	4.21	+ 0.3	16 9.8	23	34.8	-10 58.4	+0.6247	0.5440	0.0879	+82	+10		
α Tauri (<i>Aldebar.</i>)	1.1	4.23	- 0.1	16 21.3	21	0	41.2	- 9 54.2	+0.5079	0.5444	0.0863	+70	+ 4	
89 Tauri	5.8	+4.22	- 0.2	+15 52.8	1	46.6	- 8 50.8	+1.1267	0.5448	+0.0848	+90	+46		
318 B. Tauri	5.7	4.28	2.1	17 2.0	11	1.9	+ 0 6.8	+0.5757	0.5479	0.0715	+76	+ 9		
<i>m</i> Tauri	5.0	4.38	3.0	18 32.5	15	48.4	+ 4 44.1	-0.7634	0.5494	0.0644	- 9	-72		
111 Tauri	5.1	4.34	-4.9	17 18.7	23	54.1	-11 25.9	+1.0621	0.5519	0.0519	+90	+43		
115 Tauri	5.3	4.34	5.2	17 53.8	22	1	12.0	-10 10.4	+0.4853	0.5522	0.0498	+68	+ 6	
119 Tauri	4.9	+4.36	- 5.7	+18 32.2	3	34.3	- 7 52.8	-0.1057	0.5530	+0.0460	+29	-26		
120 Tauri	5.6	4.36	5.8	18 29.1	4	11.5	- 7 16.8	-0.0206	0.5531	0.0450	+34	-21		
130 Tauri	5.6	4.34	7.3	17 42.0	10	44.2	- 0 56.9	+1.1015	0.5548	0.0344	+90	+48		
B. D. +19°1110	6.0	4.40	7.8	19 50.8	13	1.3	+ 1 15.7	-1.1800	0.5553	0.0307	-44	-71		
57 Orionis	5.8	4.40	8.0	19 44.0	14	13.0	+ 2 24.9	-1.0200	0.5557	0.0287	-28	-71		
64 Orionis	5.1	+4.39	- 8.9	+19 41.4	18	11.1	+ 6 15.2	-0.8711	0.5565	+0.0221	-17	-71		
68 Orionis	5.7	4.39	9.8	19 48.4	22	10.0	+10 6.2	-0.9222	0.5574	0.0154	-20	-71		
19 B. Geminorum	6.2	4.36	10.0	18 41.9	22	53.6	+10 48.4	+0.3001	0.5575	0.0142	+54	0		
124 H. Orionis	5.7	4.34	10.1	17 55.6	23	20.0	+11 13.8	+1.1513	0.5576	0.0134	+90	+55		
71 Orionis	5.1	4.36	10.2	19 10.9	23	29.4	+11 23.0	-0.2191	0.5576	+0.0131	+23	-29		
74 B. Geminorum	6.2	+4.30	-13.2	+18 16.5	23	14	31.7	+ 1 55.1	+0.7736	0.5599	-0.0126	+90	+27	

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

THE STAR'S					AT CONJUNCTION IN R. A.							Limiting Par- allels.	
Name.	Mag.	Red'ns from 1923.0.		Apparent Declina- tion.	Greenwich Mean Time.	Hour Angle, <i>H</i>	<i>Y</i>	<i>x'</i>	<i>y'</i>	<i>N.</i>	<i>S.</i>		
		$\Delta\alpha$	$\Delta\delta$										
		<i>s</i>	<i>"</i>	<i>°</i> <i>'</i>	<i>d</i> <i>h</i> <i>m</i>	<i>h</i> <i>m</i>				<i>°</i>	<i>°</i>		
110 B. Geminorum	6.2	+4.25	-14.5	+17 51.7	23 21 26.6	+ 8 36.1	+1.0921	0.5605	-0.0245	+90	+49		
162 B. Geminorum	5.7	4.16	17.0	17 14.8	24 10 55.1	- 2 22.5	+1.2677	0.5611	0.0476	+80	+68		
<i>f</i> Geminorum	5.3	4.15	17.6	17 50.8	14 25.4	+ 1 0.7	+0.4409	0.5610	0.0535	+64	+ 3		
<i>g</i> Geminorum	5.0	4.14	18.3	18 41.6	17 27.6	+ 3 56.8	-0.6453	0.5610	0.0586	- 2	-65		
2 B. Cancri	6.0	4.06	18.9	16 43.3	23 9.8	+ 9 27.4	+1.1205	0.5608	0.0681	+90	+47		
3 Cancri	5.7	+4.07	-19.2	+17 30.9	25 0 11.4	+10 26.9	+0.1945	0.5608	-0.0697	+47	-12		
5 Cancri	5.9	4.05	19.1	16 39.8	0 31.7	+10 46.5	+1.0887	0.5608	0.0703	+90	+44		
ζ Cancri (<i>mean</i>)	4.7	4.04	20.1	17 52.5	5 25.1	- 8 30.0	-0.5799	0.5605	0.0782	+ 3	-61		
<i>d</i> ² Cancri	6.2	3.95	20.9	17 17.7	11 41.2	- 2 26.5	-0.4768	0.5600	0.0882	+ 8	-54		
90 B. Cancri	6.3	3.89	21.1	15 34.5	16 25.8	+ 2 8.5	+0.9320	0.5595	0.0955	+90	+29		
54 Cancri	6.3	+3.81	-21.8	+15 37.9	23 17.4	+ 8 46.3	+0.1800	0.5588	-0.1058	+46	-16		
<i>o</i> ¹ Cancri	5.1	3.79	22.1	15 36.8	26 2 9.2	+11 32.4	-0.1092	0.5584	0.1099	+29	-32		
<i>o</i> ² Cancri	5.7	3.79	22.2	15 52.3	2 18.3	+11 41.1	-0.4025	0.5584	0.1101	+13	-51		
81 Cancri	6.4	3.67	22.5	15 18.1	9 7.6	- 5 43.2	-0.5769	0.5576	0.1197	+ 3	-65		
π Cancri	5.6	3.69	22.9	15 15.3	10 28.0	- 4 25.4	-0.6898	0.5574	0.1215	- 4	-74		
18 Leonis	5.8	+3.50	-23.0	+12 9.5	27 0 56.8	+ 9 34.5	+0.7003	0.5556	-0.1401	+90	+ 9		
19 Leonis	6.4	3.49	23.0	11 55.1	1 26.0	+10 2.6	+0.8860	0.5556	0.1406	+90	+21		
<i>R</i> Leonis (<i>var.</i>)	4.6	3.49	23.0	11 46.8	1 29.5	+10 6.0	+1.0241	0.5555	0.1407	+90	+31		
ν Leonis	5.0	3.43	23.5	12 48.4	6 27.0	- 9 6.2	-0.7725	0.5550	0.1465	- 8	-78		
<i>A</i> Leonis	4.6	3.37	23.0	10 22.1	10 59.0	- 4 43.3	+1.1235	0.5545	0.1515	+90	+38		
α Leonis (<i>Reg.</i>)	1.3	+3.36	-23.5	+12 20.3	11 11.7	- 4 31.0	-0.9840	0.5545	-0.1517	-23	-78		
44 Leonis	5.9	3.28	22.8	9 10.2	19 5.3	+ 3 6.9	+1.1197	0.5538	0.1598	+90	+36		
45 Leonis	5.8	3.26	23.1	10 8.9	20 12.2	+ 4 11.7	-0.0874	0.5537	0.1608	+30	-37		
ρ Leonis	3.8	3.23	23.0	9 41.8	22 37.2	+ 6 31.9	-0.0041	0.5535	0.1631	+35	-32		
49 Leonis	5.7	3.22	22.8	9 2.5	23 40.0	+ 7 32.6	+0.5114	0.5534	0.1641	+69	- 4		
<i>c</i> Leonis	5.1	+3.08	-21.9	+ 6 30.6	28 11 42.6	- 4 48.6	+1.1198	0.5529	-0.1740	+90	+35		
χ Leonis	4.7	3.03	22.3	7 44.8	13 42.9	- 2 52.2	-0.5214	0.5529	0.1754	+ 7	-67		
σ Leonis	4.1	2.96	21.6	6 26.7	21 15.1	+ 4 25.1	-0.5069	0.5531	0.1804	+ 7	-67		
10 Virginis	6.2	2.73	19.0	+ 2 19.5	29 19 52.0	+ 2 17.2	-0.4449	0.5553	0.1901	+11	-63		
η Virginis	4.0	2.70	17.5	- 0 14.6	30 0 35.6	+ 6 51.3	+1.2945	0.5562	0.1911	+89	+53		
γ Virginis (<i>mean</i>)	2.9	+2.56	-16.3	- 1 1.9	10 36.6	- 7 27.9	+0.1786	0.5586	-0.1920	+46	-25		
38 Virginis	6.1	2.55	14.9	3 8.3	15 51.1	- 2 24.0	+1.3235	0.5601	0.1918	+82	+59		
<i>k</i> Virginis	5.7	2.54	14.5	3 24.1	18 46.9	+ 0 25.9	+1.0276	0.5610	0.1914	+87	+25		
46 Virginis	6.1	2.52	14.6	2 57.5	19 12.5	+ 0 50.6	+0.4951	0.5611	0.1914	+67	- 8		
48 Virginis	6.5	2.51	14.4	3 15.2	20 42.4	+ 2 17.4	+0.5080	0.5616	0.1911	+68	- 7		
65 Virginis	6.0	+2.44	-12.9	- 4 31.5	31 5 26.2	+10 43.3	+0.1406	0.5648	-0.1889	+43	-27		
66 Virginis	5.7	2.45	12.7	4 45.9	5 59.0	+11 15.0	+0.2808	0.5650	0.1887	+51	-20		
72 Virginis	6.1	2.43	11.9	6 4.6	8 36.2	-10 13.2	+1.1161	0.5660	0.1877	+84	+32		
<i>l</i> Virginis	4.8	2.11	11.9	5 51.7	9 17.6	- 9 33.3	+0.7689	0.5663	0.1875	+85	+ 8		
80 Virginis	5.6	2.39	11.9	5 0.5	10 52.5	- 8 1.7	-0.3922	0.5669	0.1868	+13	-59		
566 B. Virginis	6.4	+2.34	-11.4	- 5 6.9	14 35.4	- 4 26.5	-0.9737	0.5686	-0.1850	-22	-90		
88 Virginis	6.5	2.35	10.7	6 27.4	16 31.2	- 2 34.8	+0.0267	0.5694	0.1840	+35	-34		
598 B. Virginis	6.1	2.33	9.9	7 41.0	19 26.9	+ 0 14.7	+0.7283	0.5707	0.1823	+83	+ 5		
623 B. Virginis	6.5	+2.32	- 8.9	- 8 53.4	23 32.2	+ 4 11.5	+1.2041	0.5727	-0.1797	+82	+41		

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.		
			Washington.		Angle East from—		Washington.		Angle East from—				
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.			
Jan.	1	124 H. ¹ Orionis ‡	5.7	h m 12 26	h m 17 41	° 79	° 27	h m 13 16	h m 18 32	° 293	° 244	h m 0 50	
	2	110 B. Geminorum	6.2	7 55	13 7	50	22	8 48	14 1	328	285	0 53	
	6	37 Sextantis	6.3	6 10	11 7	68	119	7 1	11 58	329	17	0 50	
	10	6 B. Libræ	6.2	13 46	18 26	134	146	15 2	19 42	271	264	1 16	
	12	VENUS	4.3	13 54	18 22	57	90	14 50	19 18	334	357	0 56	
	19	150 B. Aquarii	6.0	2 23	6 30	20	334	3 8	7 14	296	247	0 45	
	27	275 B. Tauri	6.5	0 29	4 4	88	143	1 41	5 16	241	291	1 12	
	27	α Tauri (<i>Aldebar.</i>)	1.1	1 51	5 27	79	129	3 15	6 50	251	285	1 23	
	28	130 Tauri ‡	5.6	12 11	15 41	84	32	13 3	16 32	284	236	0 52	
	29	292 B. Orionis	6.5	0 11	3 38	88	141	1 9	4 36	260	315	0 58	
	29	26 Geminorum	5.2	11 48	15 14	84	30	12 44	16 9	293	240	0 56	
	Feb.	30	162 B. Geminorum	5.7	7 25	10 48	42	44	8 10	11 32	338	316	0 45
1		ξ Leonis	5.1	9 34	12 48	122	119	10 51	14 6	281	250	1 17	
2		48 Leonis	5.2	12 49	15 59	91	51	13 52	17 2	317	270	1 3	
3		83 Leonis	6.3	9 49	12 56	106	134	11 6	14 12	306	311	1 16	
3		τ Leonis	5.2	10 33	13 40	110	126	11 51	14 57	303	294	1 18	
6		κ Virginis	4.3	9 27	12 22	117	195	10 17	13 12	256	300	0 50	
23		70 Tauri	6.4	9 50	11 38	113	60	10 44	12 32	242	190	0 54	
23		θ ¹ Tauri ‡	4.2	11 13	13 0	114	64	12 1	13 48	241	195	0 48	
25		124 H. ¹ Orionis	5.7	11 37	13 16	38	344	12 8	13 47	334	281	0 31	
27		1 Canceri	6.0	5 44	7 17	162	207	6 18	7 51	212	250	0 34	
Mar.		3	27 B. Virginis	6.5	11 26	12 42	56	65	12 3	13 19	358	355	0 37
		4	91 G. Virginis	6.5	9 40	10 52	143	184	10 41	11 53	266	298	1 1
	7	49 Libræ	5.4	17 14	18 13	132	114	18 22	19 21	250	219	1 8	
	9	305 B. Ophiuchi	6.3	17 23	18 15	44	50	18 22	19 13	321	314	0 58	
	20	25 Arietis	6.5	7 39	7 49	74	22	8 41	8 51	262	210	1 2	
	22	179 B. Tauri	5.9	10 21	10 22	150	99	10 46	10 47	202	152	0 25	
	23	318 B. Tauri	5.7	10 8	10 6	32	338	10 40	10 38	328	275	0 33	
	24	130 Tauri	5.6	8 50	8 44	98	45	10 4	9 58	269	214	1 13	
	25	26 Geminorum	5.2	9 39	9 29	92	39	10 51	10 40	286	231	1 11	
	28	ξ Leonis	5.1	10 49	10 27	106	75	12 4	11 41	298	253	1 14	
	29	48 Leonis	5.2	14 8	13 42	76	28	14 59	14 32	327	276	0 50	
	Apr.	30	83 Leonis	6.3	10 44	10 14	101	114	11 58	11 28	311	300	1 14
30		τ Leonis	5.2	11 27	10 57	104	103	12 42	12 11	309	285	1 14	
5		192 B. Ophiuchi ‡	6.3	11 49	10 56	82	133	12 46	11 52	300	347	0 56	
19		α Tauri (<i>Aldebar.</i>)	1.1	7 2	5 14	101	52	8 19	6 31	250	196	1 17	
21		292 B. Orionis	6.5	8 31	6 35	147	100	9 22	7 26	225	172	0 51	
28		91 G. Virginis	6.5	11 32	9 8	122	143	12 47	10 23	292	293	1 15	
1		49 Libræ	5.4	14 54	12 18	114	128	16 12	13 35	278	275	1 18	
2		90 B. Ophiuchi	6.5	13 33	10 53	87	126	14 41	12 1	299	328	1 8	
4		187 B. Sagittarii	6.4	17 47	14 58	85	102	19 12	16 24	266	264	1 25	
6		95 B. Capricorni	5.9	19 49	16 52	9	25	20 27	17 30	318	325	0 38	
9		96 Aquarii ‡	5.7	16 45	13 36	86	138	17 44	14 36	242	293	0 59	
May		19	110 B. Geminorum	6.2	10 41	6 54	70	15	11 39	7 52	312	257	0 58
	23	37 Sextantis	6.3	15 49	11 46	76	24	16 36	12 32	324	272	0 47	
	1	267 B. Sagittarii	5.8	17 24	12 45	78	106	18 46	14 7	271	282	1 22	
	5	82 Aquarii ‡	6.4	16 49	11 54	51	103	17 45	12 50	278	328	0 56	
	9	64 Ceti	5.8	20 34	15 23	80	132	21 38	16 27	238	290	1 4	

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle East from—		Washington.		Angle East from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
June 22	θ Virginis	4.4	h m 15 46	h m 9 45	° 152	° 115	h m 16 41	h m 10 40	° 253	° 209	h m 0 55
23	623 B. Virginis	6.5	14 45	8 40	44	32	15 13	9 8	2	344	0 28
23	κ Virginis †	4.3	19 23	13 17	120	70	20 18	14 12	267	215	0 54
25	49 Libræ	5.4	14 10	7 57	140	164	15 15	9 2	256	266	1 5
26	90 B. Ophiuchi	6.5	13 17	7 1	80	121	14 21	8 4	308	340	1 3
28	173 B. Sagittarii	6.4	14 31	8 6	114	160	15 33	9 8	252	291	1 2
28	171 B. Sagittarii	6.1	14 46	8 22	157	201	15 16	8 51	209	250	0 29
July 2	213 B. Aquarii †	6.5	17 0	10 20	44	95	17 55	11 14	286	335	0 54
2	λ Aquarii	3.8	23 16	16 35	79	71	0 38	17 56	227	200	1 22
7	85 Ceti	6.3	22 8	15 8	37	89	23 9	16 8	279	329	1 0
9	γ Tauri	3.9	22 15	15 6	90	143	23 14	16 4	238	292	0 58
10	α Tauri (<i>Aldebar.</i>)	1.1	8 39	1 28	91	36	9 47	2 36	263	209	1 8
18	27 B. Virginis	6.5	15 33	7 50	187	141	15 52	8 8	220	172	0 19
19	38 Virginis	6.1	15 3	7 16	77	43	16 1	8 14	330	289	0 58
22	η Libræ	5.5	17 3	9 4	128	109	18 14	10 15	259	226	1 11
23	24 Scorpii	5.0	16 6	8 3	78	86	17 22	9 19	305	294	1 16
26	267 B. Sagittarii	5.8	15 8	6 54	68	114	16 12	7 57	291	330	1 4
27	47 B. Capricorni	6.2	16 22	8 4	129	174	17 12	8 53	218	256	0 49
27	61 B. Capricorni	5.9	19 13	10 53	78	97	20 38	12 19	254	253	1 25
30	ϕ Aquarii	4.4	19 16	10 45	44	89	20 24	11 53	275	313	1 8
Aug. 9	162 B. Geminorum †	5.7	0 2	14 51	93	140	0 54	15 43	266	317	0 52
22	d Sagittarii	5.0	16 10	6 9	150	186	16 49	6 48	211	241	0 39
26	81 Aquarii	6.4	0 17	13 59	87	66	1 31	15 13	220	185	1 14
26	82 Aquarii	6.4	1 45	15 27	8	331	2 27	16 8	302	259	0 41
28	10 Ceti †	6.4	18 16	7 51	19	70	18 52	8 27	304	355	0 36
30	39 B. Arietis	6.5	21 40	11 7	60	111	22 52	12 19	253	300	1 12
30	64 Ceti	5.8	2 48	16 14	43	28	4 12	17 37	269	231	1 23
Sept. 2	71 Tauri †	4.6	21 24	10 40	91	141	22 19	11 34	241	294	0 54
2	θ^2 Tauri	3.6	22 32	11 47	64	117	23 34	12 48	265	319	1 1
2	θ^1 Tauri	4.2	22 38	11 52	41	94	23 29	12 44	288	342	0 51
2	264 B. Tauri	4.8	0 0	13 15	5	59	0 25	13 40	322	16	0 25
2	85 Tauri	6.0	0 17	13 31	120	174	1 7	14 22	206	258	0 50
2	275 B. Tauri	6.5	1 34	14 48	37	88	2 40	15 54	289	331	1 6
2	α Tauri (<i>Aldebar.</i>)	1.1	3 15	16 29	30	63	4 20	17 34	300	307	1 5
3	111 Tauri	5.1	1 25	14 35	106	161	2 32	15 42	229	280	1 7
4	124 H. ¹ Orionis	5.7	0 25	13 32	91	144	1 27	14 34	254	309	1 2
6	5 Cancri †	5.9	0 31	13 30	38	85	1 2	14 1	325	14	0 31
18	173 B. Sagittarii	6.4	17 35	5 48	112	131	18 53	7 6	242	244	1 18
18	171 B. Sagittarii	6.1	17 59	6 12	162	176	18 22	6 35	193	201	0 23
18	187 B. Sagittarii	6.4	20 19	8 32	49	31	21 28	9 40	293	263	1 9
22	213 B. Aquarii	6.5	23 52	11 48	51	32	1 12	13 8	257	223	1 20
27	389 B. Ceti †	6.3	19 37	7 14	36	86	20 23	8 0	287	339	0 46
27	85 Ceti	6.3	4 11	15 47	63	30	5 37	17 12	259	211	1 26
29	179 B. Tauri	5.9	21 32	9 1	36	87	22 17	9 46	293	346	0 45
29	48 Tauri	6.3	2 5	13 34	124	168	3 1	14 29	201	231	0 56
Oct. 29	γ Tauri	3.9	5 24	16 51	144	114	6 3	17 30	194	154	0 39
2	26 Geminorum †	5.2	23 34	10 50	148	196	23 59	11 15	203	254	0 25
2	74 B. Geminorum	6.2	1 57	13 13	20	76	2 26	13 42	329	25	0 29

† Immersion below the horizon of Washington.

‡ Emerision below the horizon of Washington.

OCCULTATIONS VISIBLE AT WASHINGTON.

Date.	THE STAR'S		IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle East from—		Washington.		Angle East from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
			h m	h m	°	°	h m	h m	°	°	h m
Oct. 4	90 B. Cancri	6.3	2 53	14 1	47	100	3 31	14 42	323	17	0 41
12	η Libræ	5.5	18 35	5 13	133	97	19 33	6 11	248	205	0 58
17	61 B. Capricorni	5.9	19 58	6 16	64	73	21 25	7 43	264	253	1 26
20	φ Aquarii	4.4	22 35	8 41	52	62	0 3	10 8	253	239	1 27
27	318 B. Tauri	5.7	8 35	18 12	97	43	9 46	19 22	260	205	1 11
Nov. 2	A Leonis	4.6	7 0	16 14	147	195	7 59	17 13	248	288	0 59
3	c Leonis	5.1	6 30	15 40	147	197	7 22	16 32	251	299	0 52
16	81 Aquarii	6.4	0 27	8 47	26	4	1 34	9 54	279	244	1 7
16	URANUS	6.1	2 44	11 3	53	9	3 50	12 10	260	211	1 6
20	39 B. Arietis	6.5	22 59	7 3	81	127	0 18	8 22	226	259	1 19
20	64 Ceti	5.8	4 21	12 24	70	30	5 43	13 46	250	201	1 22
20	ξ ¹ Ceti	4.5	5 44	13 47	40	351	6 47	14 50	285	233	1 3
23	70 Tauri	6.4	22 14	6 7	84	136	23 14	7 6	244	299	1 0
23	θ ¹ Tauri	4.2	23 57	7 49	134	188	0 31	8 23	191	245	0 34
23	75 Tauri	5.2	0 0	7 52	30	84	0 52	8 44	296	349	0 51
23	264 B. Tauri	4.8	0 59	8 51	106	159	2 5	9 57	219	266	1 7
23	275 B. Tauri	6.5	3 23	11 14	140	170	4 1	11 53	189	203	0 38
23	α Tauri (<i>Aldebar.</i>)	1.1	4 58	12 50	121	107	6 6	13 58	217	178	1 8
24	115 Tauri	5.3	5 31	13 18	109	104	6 55	14 42	240	200	1 24
25	19 B. Geminorum	6.2	2 28	10 12	28	83	3 13	10 57	316	9	0 45
29	18 Leonis	5.8	5 17	12 45	121	174	6 25	13 52	265	315	1 8
29	19 Leonis	6.4	6 25	13 52	179	228	6 45	14 13	210	258	0 20
30	49 Leonis †	5.7	3 49	11 13	68	118	4 35	11 59	319	10	0 46
Dec. 12	151 B. Capricorni	6.1	22 25	5 3	49	39	23 44	6 22	264	237	1 18
15	10 Ceti ‡	6.4	5 51	12 16	39	348	6 43	13 7	282	230	0 51
18	85 Ceti	6.3	4 52	11 5	46	5	6 8	12 21	277	227	1 15
20	179 B. Tauri	5.9	21 43	3 49	71	123	22 42	4 48	256	309	0 59
20	70 Tauri	6.4	9 45	15 49	164	110	9 57	16 2	188	135	0 12
20	75 Tauri ‡	5.2	10 52	16 56	53	2	11 39	17 43	300	252	0 46
21	318 B. Tauri	5.7	22 6	4 9	45	95	22 53	4 56	290	342	0 47
24	f Geminorum	5.3	1 35	7 25	79	132	2 35	8 25	280	334	1 0
27	49 Leonis	5.7	13 28	19 4	67	21	14 16	19 52	341	291	0 47
30	46 Virginis †	6.1	6 55	12 21	137	189	7 46	13 11	263	314	0 50
30	48 Virginis	6.5	8 30	13 55	132	181	9 31	14 56	275	319	1 1

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.
FOR GREENWICH MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.22	-3.10	44.21	July 5	- 1.09	+3.37	122.44
6	- 0.21	3.67	338.36	10	+ 1.18	3.89	56.27
11	2.63	4.21	272.52	15	3.43	4.38	350.10
16	5.01	4.72	206.68	20	5.64	4.85	283.95
21	7.32	5.19	140.85	25	7.80	5.28	217.80
26	- 9.55	-5.62	75.01	30	+ 9.88	+5.68	151.66
31	11.69	6.00	9.18	Aug. 4	11.88	6.03	85.53
Feb. 5	13.71	6.34	303.35	9	13.78	6.35	19.42
10	15.61	6.62	237.51	14	15.58	6.62	313.32
15	17.37	6.86	171.68	19	17.26	6.84	247.23
20	-19.00	-7.04	105.83	24	+18.83	+7.02	181.16
25	20.48	7.16	39.98	29	20.26	7.15	115.10
Mar. 2	21.80	7.23	334.12	Sept. 3	21.56	7.22	49.05
7	22.97	7.25	268.24	8	22.72	7.25	343.02
12	23.97	7.21	202.36	13	23.74	7.22	277.00
17	-24.81	-7.11	136.46	18	+24.60	+7.14	210.99
22	25.47	6.96	70.54	23	25.30	7.01	144.99
27	25.96	6.76	4.60	28	25.83	6.83	79.00
Apr. 1	26.28	6.51	298.65	Oct. 3	26.20	6.59	13.02
6	26.41	6.21	232.67	8	26.39	6.31	307.05
11	-26.37	-5.87	166.68	13	+26.40	+5.98	241.10
16	26.13	5.48	100.66	18	26.22	5.60	175.14
21	25.72	5.06	34.63	23	25.85	5.18	109.20
26	25.12	4.60	328.57	28	25.28	4.72	43.26
May 1	24.33	4.11	262.49	Nov. 2	24.52	4.22	337.33
6	-23.37	-3.59	196.40	7	+23.56	+3.69	271.40
11	22.23	3.05	130.29	12	22.40	3.13	205.48
16	20.92	2.49	64.17	17	21.05	2.54	139.57
21	19.44	1.91	358.03	22	19.52	1.94	73.66
26	17.82	1.32	291.87	27	17.81	1.32	7.76
31	-16.05	-0.72	225.71	Dec. 2	+15.94	+0.68	301.87
June 5	14.15	-0.11	159.54	7	13.92	+0.04	235.98
10	12.14	+0.49	93.36	12	11.77	-0.60	170.10
15	10.04	1.09	27.18	17	9.51	1.24	104.23
20	7.86	1.68	320.99	22	7.17	1.86	38.36
25	- 5.63	+2.26	254.81	27	+ 4.77	-2.48	332.50
30	- 3.37	+2.82	188.62	32	+ 2.34	-3.07	266.64

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while B_0 and L_0 are the heliographic latitudes and longitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on January 1, 1854, Greenwich Mean Noon.

MEAN EQUATOR, ORBIT, AND MEAN LONGITUDE.

FOR GREENWICH MEAN NOON.

Date.	Mean Equator.			Orbit.		Mean Longitude. C	Mean Solar Days.	Motion in Mean Longitude.
	i	Δ	Ω'	Γ'	Ω			
	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "		° ' "
Jan. 0	24 58.5	354 41.7	-0 21.4	190 7.4	174 22.2	72 10.2	0.1	1 19.06
10	24 58.4	354 11.8	0 23.4	191 14.2	173 50.5	203 56.0	0.2	2 38.12
20	24 58.3	353 41.8	0 25.4	192 21.1	173 18.7	335 41.8	0.3	3 57.18
30	24 58.2	353 11.9	0 27.4	193 27.9	172 46.9	107 27.7	0.4	5 16.23
Feb. 9	24 58.1	352 41.9	0 29.4	194 34.8	172 15.1	239 13.5	0.5	6 35.29
							0.6	7 54.35
19	24 58.0	352 12.0	-0 31.4	195 41.6	171 43.4	10 59.3	0.7	9 13.41
Mar. 1	24 57.9	351 42.0	0 33.4	196 48.5	171 11.6	142 45.2	0.8	10 32.47
11	24 57.8	351 12.1	0 35.4	197 55.3	170 39.8	274 31.0	0.9	11 51.53
21	24 57.6	350 42.1	0 37.4	199 2.1	170 8.0	46 16.9	1.0	13 10.58
31	24 57.5	350 12.1	0 39.4	200 9.0	169 36.3	178 2.7	2.0	26 21.17
Apr. 10	24 57.3	349 42.2	-0 41.4	201 15.8	169 4.5	309 48.5	3.0	39 31.75
20	24 57.2	349 12.2	0 43.4	202 22.7	168 32.7	81 34.4	4.0	52 42.33
30	24 57.0	348 42.2	0 45.3	203 29.5	168 1.0	213 20.2	5.0	65 52.92
May 10	24 56.8	348 12.3	0 47.3	204 36.3	167 29.2	345 6.0	6.0	79 3.50
20	24 56.7	347 42.3	0 49.3	205 43.2	166 57.4	116 51.9	7.0	92 14.09
							8.0	105 24.67
30	24 56.5	347 12.3	-0 51.3	206 50.0	166 25.6	248 37.7	9.0	118 35.25
June 9	24 56.3	346 42.3	0 53.2	207 56.9	165 53.9	20 23.6	10.0	131 45.84
19	24 56.1	346 12.4	0 55.2	209 3.7	165 22.1	152 9.4	Hours.	° ' "
29	24 55.9	345 42.4	0 57.2	210 10.6	164 50.3	283 55.2	1	0 32.94
July 9	24 55.7	345 12.4	0 59.1	211 17.4	164 18.6	55 41.1	2	1 5.88
							3	1 38.82
19	24 55.4	344 42.4	-1 1.0	212 24.2	163 46.8	187 26.9	4	2 11.76
29	24 55.2	344 12.4	1 3.0	213 31.1	163 15.0	319 12.8	5	2 44.70
Aug. 8	24 55.0	343 42.4	1 4.9	214 37.9	162 43.2	90 58.6	6	3 17.65
18	24 54.8	343 12.4	1 6.9	215 44.8	162 11.5	222 44.4	7	3 50.59
28	24 54.5	342 42.4	1 8.8	216 51.6	161 39.7	354 30.2	8	4 23.53
							9	4 56.47
Sept. 7	24 54.2	342 12.4	-1 10.7	217 58.5	161 7.9	126 16.1	10	5 29.41
17	24 54.0	341 42.3	1 12.7	219 5.3	160 36.1	258 1.9	11	6 2.35
27	24 53.7	341 12.3	1 14.6	220 12.1	160 4.4	29 47.8	12	6 35.29
Oct. 7	24 53.4	340 42.3	1 16.5	221 19.0	159 32.6	161 33.6	13	7 8.23
17	24 53.1	340 12.2	1 18.4	222 25.8	159 0.8	293 19.5	14	7 41.17
							15	8 14.11
27	24 52.8	339 42.2	-1 20.3	223 32.7	158 29.1	65 5.3	16	8 47.06
Nov. 6	24 52.5	339 12.1	1 22.2	224 39.5	157 57.3	196 51.1	17	9 20.00
16	24 52.2	338 42.1	1 24.1	225 46.3	157 25.5	328 37.0	18	9 52.94
26	24 51.9	338 12.0	1 26.0	226 53.2	156 53.7	100 22.8	19	10 25.88
Dec. 6	24 51.6	337 42.0	1 27.8	228 0.0	156 22.0	232 8.6	20	10 58.82
							21	11 31.76
16	24 51.3	337 11.9	-1 29.7	229 6.9	155 50.2	3 54.5	22	12 4.70
26	24 50.9	336 41.8	1 31.6	230 13.7	155 18.4	135 40.3	23	12 37.64
36	24 50.6	336 11.8	-1 33.4	231 20.6	154 46.6	267 26.2		

Daily motion of Γ' +8'.684
 Daily motion of Ω -3'.177

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	-5.06	+6.56	-0.01	+0.01	81.40	+1.50	358.74
	2	4.82	6.30	0.01	0.01	93.52	1.49	4.68
	3	4.31	5.68	0.01	0.01	105.64	1.47	10.46
	4	3.61	4.71	0.01	0.01	117.77	1.46	15.65
	5	2.79	3.45	0.01	0.01	129.90	1.44	19.90
	6	-1.90	+1.97	-0.01	+0.01	142.03	+1.42	22.95
	7	0.98	+0.37	0.00	0.01	154.17	1.40	24.63
	8	-0.07	-1.26	0.00	0.01	166.32	1.38	24.87
	9	+0.82	2.81	0.00	0.01	178.47	1.36	23.68
	10	1.70	4.18	0.00	0.01	190.63	1.35	21.11
	11	+2.54	-5.30	0.00	+0.01	202.80	+1.33	17.29
	12	3.32	6.09	0.00	0.01	214.97	1.32	12.42
	13	4.01	6.52	0.00	0.01	227.15	1.31	6.81
	14	4.55	6.57	0.00	0.01	239.33	1.30	0.80
	15	4.90	6.25	0.00	0.01	251.52	1.28	354.82
	16	+5.00	-5.60	0.00	+0.01	263.71	+1.27	349.25
	17	4.80	4.66	0.00	0.01	275.90	1.26	344.40
	18	4.31	3.51	0.00	0.01	288.09	1.25	340.48
	19	3.52	2.21	0.00	0.01	300.28	1.24	337.59
	20	2.48	-0.83	-0.01	0.01	312.46	1.23	335.78
	21	+1.24	+0.56	-0.01	+0.01	324.64	+1.22	335.04
	22	-0.12	1.92	0.01	0.01	336.81	1.21	335.32
	23	1.53	3.20	0.01	0.01	348.98	1.20	336.60
	24	2.89	4.34	0.01	0.01	1.14	1.19	338.85
	25	4.10	5.31	0.01	0.01	13.30	1.17	342.03
	26	-5.09	+6.05	-0.01	+0.01	25.45	+1.16	346.10
	27	5.78	6.54	0.02	0.02	37.60	1.14	350.96
	28	6.10	6.71	0.02	0.02	49.74	1.12	356.45
	29	6.03	6.53	0.02	0.02	61.88	1.10	2.32
	30	5.58	5.99	0.02	0.02	74.01	1.07	8.23
	31	-4.79	+5.09	-0.02	+0.02	86.14	+1.05	13.76
Feb.	1	3.71	3.85	0.02	0.02	98.27	1.02	18.50
	2	2.45	2.35	0.02	0.02	110.40	0.99	22.09
	3	-1.10	+0.68	0.01	0.01	122.53	0.96	24.28
	4	+0.25	-1.03	0.01	0.01	134.67	0.92	24.95
	5	+1.52	-2.67	-0.01	+0.01	146.81	+0.89	24.09
	6	2.66	4.12	0.01	0.01	158.96	0.86	21.79
	7	3.64	5.30	0.01	0.01	171.11	0.83	18.20
	8	4.42	6.15	0.01	0.01	183.28	0.80	13.55
	9	5.01	6.63	0.01	0.01	195.45	0.78	8.13
	10	+5.37	-6.73	-0.01	+0.01	207.62	+0.75	2.28
	11	5.52	6.46	0.01	0.01	219.81	0.73	356.37
	12	5.43	5.86	0.01	0.01	232.00	0.71	350.76
	13	5.11	4.97	0.01	0.01	244.19	0.69	345.76
	14	4.56	3.85	0.01	0.01	256.38	0.67	341.59
	15	+3.78	-2.56	-0.01	+0.01	268.58	+0.65	338.39
	16	+2.79	-1.17	-0.01	+0.01	280.78	+0.63	336.24

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Feb. 16	+2.79	-1.17	-0.01	+0.01	280.78	+0.63	336.24
17	1.63	+0.26	0.01	0.01	292.98	0.61	335.16
18	+0.33	1.66	0.01	0.02	305.17	0.59	335.13
19	-1.05	2.98	0.02	0.02	317.36	0.57	336.11
20	2.45	4.17	0.02	0.02	329.55	0.55	338.06
21	-3.80	+5.19	-0.02	+0.02	341.73	+0.53	340.93
22	5.02	6.00	0.02	0.02	353.91	0.51	344.67
23	6.03	6.55	0.02	0.02	6.08	0.49	349.19
24	6.77	6.82	0.02	0.02	18.25	0.47	354.36
25	7.15	6.76	0.02	0.02	30.41	0.44	359.98
26	-7.14	+6.35	-0.02	+0.02	42.56	+0.41	5.79
27	6.70	5.57	0.02	0.02	54.71	0.38	11.44
28	5.84	4.45	0.02	0.02	66.86	0.35	16.54
Mar. 1	4.60	3.02	0.02	0.02	79.00	0.32	20.68
2	3.07	+1.35	0.02	0.02	91.14	0.28	23.53
3	-1.35	-0.43	-0.02	+0.02	103.28	+0.24	24.86
4	+0.43	2.18	0.02	0.02	115.43	0.20	24.57
5	2.15	3.77	0.02	0.02	127.57	0.17	22.68
6	3.69	5.10	0.02	0.02	139.73	0.13	19.35
7	4.96	6.07	0.02	0.02	151.88	0.09	14.83
8	+5.91	-6.64	-0.02	+0.02	164.05	+0.06	9.46
9	6.51	6.82	0.01	0.02	176.22	+0.03	3.60
10	6.76	6.61	0.01	0.02	188.40	0.00	357.66
11	6.68	6.07	0.01	0.02	200.59	-0.03	351.98
12	6.29	5.23	0.02	0.02	212.78	0.06	346.86
13	+5.64	-4.15	-0.02	+0.02	224.98	-0.08	342.53
14	4.77	2.90	0.02	0.02	237.19	0.11	339.12
15	3.72	1.53	0.02	0.02	249.40	0.13	336.72
16	2.52	-0.10	0.02	0.02	261.61	0.15	335.36
17	+1.22	+1.31	0.02	0.02	273.82	0.18	335.04
18	-0.14	+2.67	-0.02	+0.02	286.03	-0.20	335.75
19	1.53	3.90	0.02	0.02	298.24	0.22	337.44
20	2.90	4.97	0.02	0.02	310.45	0.24	340.06
21	4.20	5.83	0.02	0.02	322.66	0.26	343.56
22	5.39	6.44	0.02	0.02	334.86	0.28	347.83
23	-6.40	+6.78	-0.02	+0.02	347.06	-0.30	352.74
24	7.17	6.81	0.02	0.02	359.25	0.32	358.13
25	7.64	6.52	0.02	0.02	11.43	0.34	3.76
26	7.75	5.89	0.02	0.02	23.61	0.37	9.35
27	7.46	4.92	0.02	0.02	35.79	0.40	14.55
28	-6.74	+3.64	-0.02	+0.02	47.95	-0.42	19.02
29	5.60	2.09	0.02	0.02	60.12	0.45	22.42
30	4.07	+0.37	0.02	0.02	72.28	0.49	24.44
31	2.23	-1.41	0.02	0.02	84.43	0.52	24.90
Apr. 1	-0.22	3.11	0.02	0.02	96.59	0.56	23.70
2	+1.81	-4.58	-0.02	+0.02	108.74	-0.59	20.88
3	+3.70	-5.72	-0.02	+0.02	120.90	-0.62	16.66

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		<i>C</i>
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Apr. 1	-0.22	-3.11	-0.02	+0.02	96.59	-0.56	23.70
2	+1.81	4.58	0.02	0.02	108.74	0.59	20.88
3	3.70	5.72	0.02	0.02	120.90	0.62	16.66
4	5.30	6.45	0.02	0.02	133.07	0.66	11.36
5	6.52	6.75	0.02	0.02	145.24	0.69	5.41
6	+7.28	-6.64	-0.02	+0.02	157.42	-0.72	359.27
7	7.59	6.16	0.02	0.02	169.61	0.75	353.36
8	7.46	5.37	0.02	0.02	181.80	0.78	348.00
9	6.95	4.34	0.02	0.02	194.00	0.80	343.44
10	6.12	3.12	0.02	0.02	206.21	0.82	339.81
11	+5.06	-1.79	-0.02	+0.02	218.42	-0.85	337.19
12	3.83	-0.39	0.02	0.02	230.64	0.87	335.59
13	2.48	+1.01	0.02	0.02	242.86	0.89	335.03
14	+1.09	2.36	0.02	0.02	255.08	0.91	335.48
15	-0.30	3.61	0.02	0.02	267.31	0.92	336.93
16	-1.67	+4.70	-0.02	+0.02	279.54	-0.94	339.34
17	2.96	5.59	0.02	0.02	291.77	0.96	342.68
18	4.16	6.25	0.02	0.02	303.99	0.97	346.72
19	5.24	6.63	0.02	0.02	316.22	0.98	351.49
20	6.16	6.72	0.02	0.02	328.44	1.00	356.75
21	-6.88	+6.50	-0.03	+0.02	340.65	-1.01	2.27
22	7.36	5.96	0.03	0.02	352.86	1.02	7.78
23	7.55	5.11	0.02	0.02	5.07	1.04	13.00
24	7.40	3.96	0.02	0.02	17.27	1.06	17.60
25	6.88	2.56	0.02	0.02	29.46	1.08	21.29
26	-5.96	+0.96	-0.02	+0.02	41.64	-1.10	23.80
27	4.63	-0.74	0.02	0.02	53.82	1.12	24.90
28	2.94	2.42	0.02	0.02	66.00	1.14	24.44
29	-0.99	3.96	0.02	0.02	78.17	1.17	22.35
30	+1.07	5.23	0.02	0.02	90.34	1.19	18.72
May 1	+3.08	-6.11	-0.02	+0.02	102.52	-1.22	13.77
2	4.86	6.57	0.02	0.02	114.69	1.24	7.89
3	6.26	6.58	0.02	0.02	126.87	1.26	1.57
4	7.18	6.18	0.02	0.02	139.06	1.28	355.33
5	7.60	5.45	0.02	0.02	151.25	1.30	349.59
6	+7.53	-4.45	-0.02	+0.02	163.44	-1.32	344.64
7	7.03	3.26	0.02	0.02	175.65	1.33	340.68
8	6.17	1.94	0.02	0.02	187.86	1.35	337.75
9	5.04	-0.56	0.02	0.02	200.08	1.36	335.89
10	3.74	+0.82	0.02	0.02	212.30	1.38	335.08
11	+2.34	+2.16	-0.02	+0.03	224.53	-1.39	335.29
12	+0.93	3.40	0.02	0.03	236.77	1.40	336.50
13	-0.44	4.49	0.02	0.03	249.00	1.41	338.67
14	1.73	5.40	0.02	0.03	261.24	1.42	341.75
15	2.90	6.07	0.02	0.03	273.49	1.43	345.87
16	-3.94	+6.48	-0.02	+0.03	285.73	-1.43	350.32
17	-4.82	+6.60	-0.02	+0.03	297.97	-1.44	355.51

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
May	17	-4.82	+6.60	-0.02	+0.03	297.97	-1.44	355.51
	18	5.55	6.41	0.02	0.03	310.21	1.44	1.01
	19	6.10	5.91	0.02	0.03	322.44	1.44	6.55
	20	6.46	5.11	0.02	0.03	334.67	1.45	11.83
	21	6.59	4.03	0.02	0.02	346.90	1.45	16.54
	22	-6.48	+2.71	-0.02	+0.02	359.12	-1.45	20.41
	23	6.07	+1.21	0.02	0.02	11.33	1.46	23.19
	24	5.33	-0.39	0.02	0.02	23.54	1.46	24.70
	25	4.25	2.01	0.02	0.02	35.74	1.47	24.78
	26	2.84	3.52	0.01	0.02	47.93	1.48	23.36
	27	-1.16	-4.82	-0.01	+0.02	60.12	-1.48	20.41
	28	+0.67	5.80	0.01	0.02	72.31	1.49	16.05
	29	2.51	6.38	0.01	0.02	84.49	1.50	10.54
	30	4.19	6.52	0.01	0.02	96.68	1.51	4.32
	31	5.56	6.23	0.01	0.02	108.86	1.52	357.88
June	1	+6.51	-5.56	-0.01	+0.02	121.05	-1.53	351.75
	2	6.97	4.60	0.01	0.02	133.24	1.53	346.33
	3	6.94	3.41	0.01	0.03	145.44	1.54	341.89
	4	6.48	2.08	0.01	0.03	157.65	1.54	338.55
	5	5.65	-0.69	0.01	0.03	169.86	1.54	336.33
	6	+4.54	+0.70	-0.01	+0.03	182.08	-1.55	335.21
	7	3.25	2.04	0.01	0.03	194.31	1.55	335.14
	8	1.88	3.28	0.01	0.03	206.54	1.55	336.08
	9	+0.50	4.38	0.01	0.03	218.77	1.55	338.00
	10	-0.82	5.30	0.01	0.03	231.01	1.55	340.84
	11	-2.00	+5.99	-0.01	+0.03	243.26	-1.55	344.54
	12	3.03	6.42	0.01	0.03	255.51	1.55	349.02
	13	3.86	6.57	0.02	0.03	267.76	1.54	354.12
	14	4.51	6.40	0.02	0.03	280.01	1.54	359.63
	15	4.96	5.92	0.02	0.03	292.26	1.53	5.25
	16	-5.23	+5.13	-0.02	+0.03	304.51	-1.52	10.68
	17	5.33	4.06	0.01	0.03	316.75	1.51	15.58
	18	5.25	2.76	0.01	0.03	328.99	1.50	19.66
	19	4.99	+1.29	0.01	0.03	341.23	1.49	22.68
	20	4.52	-0.28	0.01	0.03	353.46	1.48	24.47
	21	-3.83	-1.86	-0.01	+0.03	5.68	-1.47	24.90
	22	2.90	3.35	0.01	0.03	17.90	1.46	23.91
	23	1.74	4.65	-0.01	0.03	30.11	1.46	21.49
	24	-0.39	5.66	0.00	0.03	42.31	1.45	17.69
	25	+1.07	6.31	0.00	0.03	54.51	1.44	12.70
	26	+2.54	-6.55	0.00	+0.03	66.70	-1.43	6.82
	27	3.88	6.36	0.00	0.03	78.89	1.42	0.48
	28	4.98	5.78	0.00	0.03	91.08	1.42	354.17
	29	5.73	4.86	0.00	0.03	103.27	1.41	348.38
	30	6.08	3.68	0.00	0.03	115.46	1.40	343.47
July	1	+6.00	-2.34	0.00	+0.03	127.66	-1.39	339.64
	2	+5.53	-0.92	0.00	+0.03	139.86	-1.38	336.97

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
July	1	+6.00	-2.34	0.00	+0.03	127.66	-1.39	339.64
	2	5.53	-0.92	0.00	0.03	139.86	1.38	336.97
	3	4.72	+0.52	0.00	0.03	152.07	1.37	335.46
	4	3.64	1.90	0.00	0.03	164.28	1.36	335.06
	5	2.39	3.18	0.00	0.03	176.50	1.35	335.70
	6	+1.05	+4.32	0.00	+0.03	188.73	-1.34	337.33
	7	-0.28	5.27	0.00	0.03	200.96	1.33	339.90
	8	1.53	6.00	0.00	0.03	213.20	1.32	343.34
	9	2.63	6.47	-0.01	0.03	225.44	1.31	347.58
	10	3.52	6.65	0.01	0.03	237.68	1.30	352.50
	11	-4.18	+6.53	-0.01	+0.03	249.93	-1.29	357.92
	12	4.59	6.09	0.01	0.03	262.18	1.27	359
	13	4.75	5.32	0.01	0.03	274.44	1.26	9.18
	14	4.69	4.26	-0.01	0.03	286.69	1.24	14.33
	15	4.43	2.95	0.00	0.03	298.94	1.22	18.73
	16	-4.00	+1.45	0.00	+0.03	311.19	-1.20	22.08
	17	3.42	-0.15	0.00	0.03	323.43	1.18	24.18
	18	2.71	1.76	0.00	0.03	335.67	1.15	24.92
	19	1.87	3.27	0.00	0.03	347.90	1.13	24.24
	20	-0.92	4.60	0.00	0.03	0.13	1.11	22.16
	21	+0.12	-5.64	0.00	+0.03	12.34	-1.09	18.75
	22	1.21	6.34	0.00	0.03	24.55	1.07	14.16
	23	2.31	6.65	0.00	0.03	36.76	1.04	8.65
	24	3.34	6.55	0.00	0.03	48.96	1.02	2.56
	25	4.23	6.05	0.00	0.03	61.15	1.00	356.33
	26	+4.90	-5.20	-0.01	+0.03	73.34	-0.98	350.40
	27	5.29	4.07	0.01	0.03	85.53	0.95	345.17
	28	5.36	2.74	0.01	0.03	97.72	0.93	340.93
	29	5.10	-1.29	-0.01	0.03	109.91	0.91	337.81
	30	4.52	+0.19	0.00	0.03	122.11	0.89	335.87
	31	+3.66	+1.64	0.00	+0.03	134.30	-0.87	335.08
Aug.	1	2.58	2.98	0.00	0.03	146.51	0.85	335.39
	2	1.34	4.18	0.00	0.03	158.71	0.83	336.71
	3	+0.03	5.19	0.00	0.03	170.92	0.81	338.99
	4	-1.27	5.98	0.00	0.03	183.14	0.80	342.15
	5	-2.48	+6.52	0.00	+0.03	195.37	-0.78	346.11
	6	3.54	6.77	0.00	0.03	207.60	0.76	350.78
	7	4.37	6.73	0.00	0.03	219.83	0.74	356.01
	8	4.93	6.36	0.00	0.03	232.07	0.72	1.59
	9	5.19	5.67	0.00	0.03	244.31	0.70	7.24
	10	-5.13	+4.67	0.00	+0.03	256.56	-0.68	12.62
	11	4.78	3.38	0.00	0.03	268.81	0.66	17.36
	12	4.15	1.87	0.00	0.03	281.05	0.63	21.15
	13	3.30	+0.22	0.00	0.03	293.30	0.61	23.70
	14	2.29	-1.46	0.00	0.03	305.54	0.58	24.85
	15	-1.17	-3.06	0.00	+0.03	317.78	-0.55	24.53
	16	0.00	-4.47	+0.01	+0.03	330.02	-0.52	22.74

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Aug. 16	0.00	-4.47	+0.01	+0.03	330.02	-0.52	22.74
17	+1.15	5.59	0.01	0.03	342.24	0.49	19.59
18	2.25	6.36	0.01	0.03	354.46	0.46	15.24
19	3.24	6.74	0.01	0.03	6.68	0.43	9.95
20	4.08	6.70	0.01	0.03	18.88	0.40	4.06
21	+4.74	-6.28	+0.01	+0.03	31.08	-0.37	357.94
22	5.19	5.51	0.01	0.03	43.27	0.34	352.02
23	5.41	4.45	0.01	0.03	55.46	0.30	346.66
24	5.37	3.16	0.01	0.03	67.65	0.27	342.16
25	5.08	1.73	0.01	0.03	79.83	0.24	338.71
26	+4.54	-0.24	+0.01	+0.03	92.01	-0.21	336.39
27	3.77	+1.24	0.01	0.03	104.19	0.18	335.23
28	2.79	2.64	0.01	0.03	116.38	0.15	335.18
29	1.66	3.90	0.01	0.03	128.56	0.13	336.19
30	+0.41	4.98	0.01	0.04	140.75	0.10	338.18
31	-0.90	+5.84	+0.01	+0.04	152.95	-0.08	341.06
Sept. 1	2.20	6.46	0.01	0.04	165.15	0.06	344.76
2	3.42	6.80	+0.01	0.04	177.35	0.04	349.18
3	4.49	6.84	0.00	0.04	189.56	-0.02	354.17
4	5.34	6.58	0.00	0.04	201.77	0.00	359.56
5	-5.91	+6.00	0.00	+0.04	213.99	+0.02	5.13
6	6.15	5.11	0.00	0.04	226.22	0.04	10.58
7	6.01	3.92	+0.01	0.03	238.45	0.06	15.57
8	5.49	2.48	0.01	0.03	250.68	0.08	19.77
9	4.61	+0.85	0.01	0.03	262.92	0.11	22.86
10	-3.40	-0.87	+0.01	+0.03	275.16	+0.13	24.59
11	1.96	2.56	0.01	0.03	287.39	0.16	24.80
12	-0.38	4.08	0.01	0.03	299.62	0.19	23.45
13	+1.23	5.33	0.01	0.03	311.85	0.22	20.61
14	2.74	6.22	0.01	0.03	324.07	0.26	16.46
15	+4.06	-6.70	+0.01	+0.03	336.29	+0.29	11.27
16	5.13	6.75	0.01	0.03	348.50	0.32	5.41
17	5.89	6.40	0.02	0.03	0.70	0.35	359.28
18	6.33	5.70	0.02	0.03	12.89	0.39	353.31
19	6.46	4.70	0.02	0.03	25.08	0.42	347.85
20	+6.30	-3.47	+0.02	+0.03	37.26	+0.46	343.19
21	5.88	2.09	0.02	0.03	49.44	0.49	339.52
22	5.24	-0.62	0.02	0.04	61.61	0.52	336.93
23	4.41	+0.85	0.02	0.04	73.78	0.55	335.46
24	3.42	2.26	0.01	0.04	85.95	0.58	335.10
25	+2.30	+3.56	+0.01	+0.04	98.12	+0.61	335.80
26	+1.08	4.68	0.01	0.04	110.29	0.64	337.51
27	-0.20	5.60	0.01	0.04	122.46	0.66	340.14
28	1.51	6.27	-0.01	0.04	134.63	0.68	343.61
29	2.80	6.68	0.01	0.04	146.81	0.70	347.81
30	-4.03	+6.80	+0.01	+0.04	158.99	+0.72	352.60
Oct. 1	-5.14	+6.63	+0.01	+0.04	171.17	+0.73	357.81

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR GREENWICH MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
Oct.	1	-5.14	+6.63	+0.01	+0.04	171.17	+0.73	357.81
	2	6.05	6.15	0.01	0.04	183.36	0.75	3.25
	3	6.70	5.38	0.01	0.04	195.56	0.76	8.64
	4	7.03	4.33	0.01	0.04	207.76	0.78	13.72
	5	6.98	3.01	0.01	0.04	219.97	0.79	18.17
	6	-6.49	+1.49	+0.01	+0.04	232.18	+0.81	21.69
	7	5.55	-0.17	0.01	0.03	244.39	0.83	24.00
	8	4.19	1.87	0.01	0.03	256.61	0.85	24.89
	9	2.48	3.47	0.01	0.03	268.83	0.87	24.20
	10	-0.54	4.85	0.01	0.03	281.05	0.89	21.91
	11	+1.47	-5.88	+0.01	+0.03	293.27	+0.91	18.13
	12	3.38	6.50	0.01	0.03	305.49	0.94	13.10
	13	5.03	6.67	0.01	0.03	317.70	0.96	7.22
	14	6.31	6.41	0.01	0.03	329.90	0.99	0.94
	15	7.15	5.77	0.01	0.03	342.10	1.02	354.75
	16	+7.56	-4.81	+0.02	+0.03	354.29	+1.05	349.05
	17	7.55	3.62	0.02	0.04	6.47	1.08	344.16
	18	7.18	2.28	0.02	0.04	18.64	1.11	340.26
	19	6.51	-0.85	0.02	0.04	30.81	1.14	337.43
	20	5.62	+0.59	0.02	0.04	42.97	1.16	335.72
	21	+4.56	+1.98	+0.02	+0.04	55.13	+1.19	335.10
	22	3.39	3.27	0.01	0.04	67.29	1.22	335.54
	23	2.15	4.41	0.01	0.04	79.44	1.24	336.99
	24	+0.86	5.35	0.01	0.04	91.59	1.26	339.38
	25	-0.44	6.05	0.01	0.04	103.74	1.28	342.64
	26	-1.72	+6.50	+0.01	+0.04	115.89	+1.29	346.66
	27	2.98	6.66	0.01	0.04	128.05	1.30	351.31
	28	4.17	6.54	0.01	0.04	140.20	1.31	356.41
	29	5.26	6.12	0.01	0.04	152.36	1.32	1.76
	30	6.20	5.43	0.01	0.04	164.53	1.32	7.11
	31	-6.92	+4.47	+0.01	+0.04	176.70	+1.32	12.20
Nov.	1	7.37	3.27	0.01	0.04	188.87	1.33	16.76
	2	7.46	1.87	0.01	0.04	201.05	1.33	20.52
	3	7.13	+0.32	0.01	0.04	213.24	1.34	23.23
	4	6.34	-1.30	0.01	0.04	225.43	1.35	24.69
	5	-5.07	-2.88	+0.01	+0.04	237.63	+1.35	24.70
	6	3.37	4.30	0.01	0.03	249.83	1.35	23.15
	7	-1.35	5.45	0.01	0.03	262.04	1.36	20.03
	8	+0.84	6.22	0.01	0.03	274.24	1.37	15.47
	9	3.00	6.53	0.01	0.03	286.45	1.39	9.77
	10	+4.91	-6.39	+0.01	+0.04	298.65	+1.40	3.39
	11	6.44	5.82	0.01	0.04	310.84	1.42	356.89
	12	7.47	4.90	0.01	0.04	323.03	1.43	350.78
	13	7.98	3.72	0.01	0.04	335.22	1.45	345.46
	14	8.01	2.38	0.01	0.04	347.40	1.47	341.17
	15	+7.60	-0.96	+0.01	+0.04	359.57	+1.48	338.03
	16	+6.86	+0.48	+0.01	+0.04	11.73	+1.50	336.03

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.
FOR GREENWICH MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
Nov. 16	+6.86	+0.48	+0.01	+0.04	11.73	+1.50	336.03
17	5.85	1.86	0.01	0.04	23.89	1.52	335.16
18	4.68	3.14	0.01	0.04	36.04	1.54	335.36
19	3.40	4.27	0.01	0.04	48.19	1.55	336.56
20	2.08	5.21	0.01	0.04	60.33	1.56	338.72
21	+0.77	+5.92	+0.01	+0.04	72.47	+1.57	341.77
22	-0.51	6.38	0.01	0.04	84.61	1.58	345.61
23	1.73	6.56	0.01	0.04	96.74	1.58	350.13
24	2.89	6.46	0.01	0.04	108.88	1.58	355.16
25	3.96	6.06	+0.01	0.04	121.02	1.57	0.49
26	-4.94	+5.39	0.00	+0.04	133.16	+1.57	5.87
27	5.78	4.47	0.00	0.04	145.30	1.56	11.02
28	6.46	3.31	0.00	0.04	157.45	1.55	15.68
29	6.92	1.97	0.00	0.04	169.60	1.54	19.60
30	7.08	+0.50	0.00	0.04	181.76	1.52	22.55
Dec. 1	-6.90	-1.04	0.00	+0.04	193.92	+1.51	24.35
2	6.32	2.56	0.00	0.04	206.09	1.50	24.86
3	5.29	3.96	0.00	0.04	218.27	1.49	23.95
4	3.83	5.14	0.00	0.04	230.45	1.49	21.55
5	-2.02	6.00	0.00	0.04	242.64	1.48	17.69
6	+0.02	-6.45	0.00	+0.04	254.83	+1.47	12.53
7	2.10	6.44	0.00	0.04	267.03	1.47	6.40
8	4.03	5.98	0.00	0.04	279.22	1.47	359.80
9	5.64	5.13	+0.01	0.04	291.41	1.47	353.30
10	6.79	3.96	0.01	0.04	303.60	1.47	347.43
11	+7.44	-2.60	+0.01	+0.04	315.78	+1.47	342.58
12	7.58	-1.13	+0.01	0.04	327.96	1.47	338.93
13	7.26	+0.36	0.00	0.04	340.13	1.47	336.52
14	6.57	1.78	0.00	0.04	352.30	1.48	335.30
15	5.59	3.09	0.00	0.04	4.46	1.48	335.22
16	+4.41	+4.24	0.00	+0.04	16.61	+1.48	336.17
17	3.12	5.20	0.00	0.04	28.75	1.48	338.09
18	1.79	5.93	0.00	0.04	40.89	1.48	340.91
19	+0.49	6.40	0.00	0.04	53.03	1.48	344.54
20	-0.75	6.60	0.00	0.04	65.16	1.47	348.89
21	-1.88	+6.52	0.00	+0.04	77.29	+1.46	353.82
22	2.89	6.14	0.00	0.04	89.42	1.45	359.12
23	3.78	5.47	0.00	0.04	101.55	1.43	4.56
24	4.54	4.54	0.00	0.04	113.68	1.41	9.85
25	5.16	3.38	0.00	0.04	125.81	1.39	14.69
26	-5.62	+2.03	0.00	+0.04	137.94	+1.37	18.81
27	5.89	+0.56	0.00	0.04	150.08	1.34	21.99
28	5.94	-0.96	0.00	0.04	162.23	1.32	24.04
29	5.73	2.46	0.00	0.04	174.38	1.29	24.85
30	5.22	3.86	0.00	0.04	186.53	1.26	24.34
31	-4.38	-5.05	0.00	+0.04	198.69	+1.24	22.45
32	-3.22	-5.95	0.00	+0.04	210.86	+1.22	19.20

622 ILLUMINATED DISK OF MERCURY, 1923.

FOR GREENWICH MEAN NOON.

Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.	Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.
Jan. 1	0.882	40	358	42.3	-0.7	July 5	0.688	68	174	56.8	-0.5
6	0.792	54	353	52.3	0.6	10	0.830	49	181	65.0	1.0
11	0.648	73	348	62.2	-0.5	15	0.942	28	192	68.0	1.4
16	0.439	97	343	62.5	0.0	20	0.994	9	223	63.4	1.7
21	0.200	127	337	39.9	+0.8	25	0.989	12	348	54.3	1.5
26	0.032	159	317	7.7	+2.2	30	0.950	26	6	45.4	-1.0
31	0.027	161	201	5.9	2.3	Aug. 4	0.897	37	13	38.7	0.6
Feb. 5	0.148	135	180	25.4	1.3	9	0.843	47	18	34.2	0.3
10	0.301	113	174	36.9	0.8	14	0.788	55	21	31.5	-0.1
15	0.435	97	171	38.5	0.5	19	0.734	62	23	30.3	+0.1
20	0.542	85	167	36.2	+0.3	24	0.676	69	25	30.2	+0.2
25	0.625	76	164	33.3	0.2	29	0.613	77	27	31.0	0.4
Mar. 2	0.691	67	161	31.0	0.2	Sept. 3	0.539	86	28	32.4	0.5
7	0.747	60	157	29.7	+0.1	8	0.450	96	30	33.7	0.6
12	0.796	54	154	29.4	0.0	13	0.340	109	32	33.4	0.8
17	0.842	47	152	30.3	-0.2	18	0.212	125	35	27.9	+1.2
22	0.885	40	149	32.5	0.4	23	0.082	147	41	14.3	1.9
27	0.928	31	147	36.5	0.7	28	0.006	171	86	1.2	2.9
Apr. 1	0.968	21	143	42.6	1.1	Oct. 3	0.056	153	196	11.9	2.0
6	0.995	8	131	51.2	1.5	8	0.240	121	205	43.2	+0.7
11	0.993	10	346	61.3	-1.7	13	0.481	92	208	64.1	-0.2
16	0.937	29	337	68.8	1.4	18	0.692	67	210	64.4	0.6
21	0.817	51	337	68.8	1.0	23	0.836	48	210	54.5	0.8
26	0.658	72	339	61.3	-0.5	28	0.920	33	210	44.0	0.9
May 1	0.496	90	341	50.5	+0.1	Nov. 2	0.966	21	209	36.0	0.9
6	0.350	107	343	39.4	+0.6	7	0.989	12	207	30.5	-0.9
11	0.226	123	345	28.6	1.1	12	0.998	5	202	27.1	0.9
16	0.124	139	347	17.7	1.7	17	1.000	2	37	25.1	0.8
21	0.047	155	351	7.6	2.4	22	0.995	8	25	24.4	0.7
26	0.006	171	8	1.1	3.1	27	0.985	14	20	24.8	0.6
31	0.007	170	134	1.2	+3.1	Dec. 2	0.969	20	16	26.2	-0.6
June 5	0.048	155	151	7.4	2.4	7	0.944	27	12	29.1	0.5
10	0.117	140	155	16.2	1.8	12	0.906	36	7	33.6	0.5
15	0.205	126	158	24.7	1.3	17	0.847	46	2	40.4	0.5
20	0.306	113	161	32.2	0.9	22	0.754	60	358	49.5	0.5
25	0.419	99	165	39.6	+0.5	27	0.609	77	354	58.6	-0.3
30	0.547	85	169	47.7	0.0	32	0.403	101	349	58.6	+0.1

NOTATION.

- k*—the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.
- i*—the angle between the Sun and Earth, as seen from the planet.
- θ —the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.
- L*—the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

FOR GREENWICH MEAN NOON.

Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.	Date.	<i>k</i>	<i>i</i>	θ	<i>L</i>	Stellar Mag.
Jan. 1	0.274	116.8	197.0	211.9	-4.4	July 5	0.949	26.0	176.1	49.4	-3.3
6	0.315	111.7	195.7	207.4	4.4	10	0.956	24.1	179.3	48.9	3.3
11	0.352	107.2	194.2	199.3	4.3	15	0.963	22.1	182.6	48.4	3.3
16	0.387	103.0	192.5	189.5	4.3	20	0.969	20.2	186.1	47.9	3.4
21	0.420	99.2	190.5	179.0	4.2	25	0.975	18.2	189.6	47.5	3.4
26	0.450	95.7	188.4	168.4	-4.2	30	0.980	16.3	193.1	47.2	-3.4
31	0.478	92.5	186.1	158.2	4.1	Aug. 4	0.984	14.3	196.8	46.9	3.4
Feb. 5	0.505	89.4	183.8	148.6	4.1	9	0.988	12.4	200.6	46.6	3.4
10	0.530	86.5	181.3	139.6	4.0	14	0.992	10.5	204.7	46.4	3.4
15	0.554	83.8	178.7	131.2	4.0	19	0.994	8.6	209.3	46.2	3.4
20	0.577	81.2	176.2	123.6	-3.9	24	0.996	6.7	215.1	46.1	-3.4
25	0.598	78.6	173.6	116.6	3.9	29	0.998	4.9	223.4	46.0	3.5
Mar. 2	0.619	76.2	171.1	110.2	3.8	Sept. 3	0.999	3.3	238.3	45.9	3.5
7	0.639	73.9	168.7	104.3	3.8	8	1.000	2.1	272.1	45.9	3.5
12	0.658	71.6	166.4	99.0	3.7	13	1.000	2.3	323.5	45.9	3.5
17	0.676	69.4	164.2	94.1	-3.7	18	0.999	3.6	351.0	45.9	-3.5
22	0.693	67.2	162.2	89.6	3.6	23	0.998	5.2	2	46.0	3.5
27	0.710	65.1	160.4	85.5	3.6	28	0.996	6.9	8.8	46.1	3.4
Apr. 1	0.727	63.0	158.8	81.8	3.6	Oct. 3	0.994	8.7	12.3	46.2	3.4
6	0.742	61.0	157.4	78.4	3.5	8	0.992	10.4	14.3	46.4	3.4
11	0.758	59.0	156.3	75.3	-3.5	13	0.989	12.2	15.4	46.6	-3.4
16	0.772	57.0	155.4	72.4	3.5	18	0.985	13.9	15.8	46.9	3.4
21	0.787	55.0	154.8	69.8	3.5	23	0.981	15.6	15.7	47.2	3.4
26	0.800	53.1	154.4	67.4	3.4	28	0.977	17.3	15.2	47.6	3.4
May 1	0.814	51.1	154.3	65.2	3.4	Nov. 2	0.973	19.0	14.2	48.0	3.4
6	0.827	49.2	154.4	63.2	-3.4	7	0.968	20.7	12.9	48.4	-3.4
11	0.839	47.3	154.8	61.4	3.4	12	0.962	22.4	11.3	48.9	3.4
16	0.851	45.3	155.5	59.7	3.4	17	0.956	24.1	9.5	49.5	3.3
21	0.863	43.4	156.4	58.2	3.3	22	0.950	25.8	7.4	50.2	3.3
26	0.874	41.5	157.6	56.8	3.3	27	0.944	27.4	5.1	50.9	3.3
31	0.885	39.6	159.1	55.5	-3.3	Dec. 2	0.937	29.1	2.7	51.6	-3.3
5	0.896	37.7	160.8	54.4	3.3	7	0.930	30.8	0.2	52.4	3.3
10	0.906	35.7	162.8	53.3	3.3	12	0.922	32.4	357.7	53.3	3.3
15	0.916	33.8	165.0	52.4	3.3	17	0.914	34.1	355.2	54.3	3.4
20	0.925	31.9	167.5	51.5	3.3	22	0.906	35.8	352.8	55.4	3.4
25	0.933	29.9	170.2	50.7	-3.3	27	0.897	37.5	350.5	56.6	-3.4
30	0.941	28.0	173.1	50.0	-3.3	32	0.887	39.2	348.3	57.8	-3.4

NOTATION.

k—the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i—the angle between the Sun and Earth, as seen from the planet.

θ —the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L—the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180^{\circ}$	D_{\oplus}	$A_{\odot}-A_{\oplus}$	D_{\odot}	\odot_{δ}
	m		°	°	°	°	°	°
Jan. 1	12.66	+1.0	341.71	76.69	-24.35	+42.11	-21.30	296.67
3	12.78	1.0	340.90	78.29	24.49	41.76	21.06	297.86
5	12.90	1.0	340.11	79.90	24.62	41.39	20.81	299.05
7	13.02	1.0	339.32	81.52	24.73	41.02	20.56	300.23
9	13.15	1.0	338.55	83.13	24.82	40.63	20.30	301.41
11	13.27	+1.1	337.79	84.74	-24.90	+40.24	-20.03	302.59
13	13.39	1.1	337.04	86.36	24.95	39.84	19.75	303.77
15	13.52	1.1	336.31	87.98	24.99	39.43	19.46	304.94
17	13.64	1.1	335.58	89.59	25.01	39.01	19.17	306.11
19	13.77	1.1	334.88	91.21	25.01	38.58	18.87	307.27
21	13.89	+1.2	334.18	92.82	-24.99	+38.15	-18.56	308.43
23	14.01	1.2	333.51	94.43	24.95	37.72	18.25	309.59
25	14.14	1.2	332.85	96.04	24.90	37.28	17.94	310.74
27	14.26	1.2	332.20	97.64	24.83	36.83	17.61	311.89
29	14.39	1.2	331.58	99.24	24.74	36.38	17.28	313.04
31	14.51	+1.2	330.97	100.84	-24.64	+35.92	-16.95	314.18
Feb. 2	14.63	1.3	330.38	102.43	24.51	35.47	16.61	315.31
4	14.76	1.3	329.81	104.01	24.37	35.01	16.26	316.45
6	14.88	1.3	329.27	105.59	24.22	34.55	15.91	317.58
8	15.01	1.3	328.74	107.17	24.04	34.08	15.56	318.70
10	15.13	+1.3	328.23	108.73	-23.85	+33.62	-15.20	319.83
12	15.25	1.3	327.74	110.29	23.65	33.16	14.84	320.94
14	15.38	1.4	327.28	111.85	23.43	32.69	14.47	322.06
16	15.50	1.4	326.84	113.39	23.19	32.23	14.10	323.17
18	15.62	1.4	326.42	114.93	22.94	31.76	13.73	324.28
20	15.74	+1.4	326.02	116.46	-22.67	+31.30	-13.35	325.38
22	15.87	1.4	325.65	117.98	22.39	30.84	12.97	326.48
24	15.99	1.4	325.30	119.49	22.10	30.38	12.59	327.58
26	16.11	1.5	324.97	120.99	21.79	29.93	12.20	328.67
28	16.23	1.5	324.67	122.48	21.47	29.48	11.81	329.76
Mar. 2	16.35	+1.5	324.39	123.97	-21.14	+29.02	-11.42	330.84
4	16.47	1.5	324.14	125.44	20.79	28.58	11.03	331.92
6	16.59	1.5	323.91	126.90	20.43	28.13	10.63	333.00
8	16.71	+1.5	323.70	128.36	-20.06	+27.69	-10.24	334.07

Dec. 10	18.30	+1.8	36.20	308.93	+18.67	-25.77	+23.42	102.05
12	18.18	1.8	36.35	310.23	18.31	26.09	23.33	102.96
14	18.05	1.8	36.48	311.52	17.95	26.40	23.24	103.87
16	17.92	1.8	36.59	312.81	17.57	26.70	23.14	104.78
18	17.79	1.8	36.67	314.09	17.18	27.00	23.03	105.69
20	17.66	+1.8	36.74	315.37	+16.79	-27.29	+22.92	106.60
22	17.53	1.8	36.79	316.64	16.39	27.58	22.80	107.52
24	17.40	1.8	36.82	317.91	15.98	27.86	22.68	108.44
26	17.27	1.8	36.83	319.17	15.56	28.14	22.55	109.36
28	17.13	1.7	36.81	320.43	15.14	28.41	22.41	110.28
30	16.99	+1.7	36.78	321.69	+14.71	-28.68	+22.27	111.20
32	16.86	+1.7	36.73	322.94	+14.27	-28.94	+22.12	112.13

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

FOR GREENWICH MEAN MIDNIGHT.

Mean Time of Transit of
Zero Meridian.

Date.		k	Diameter.	i	q	Q	Central Meridian.		Zero Meridian.		
							Of Date.	Of Intermediate Date.	Of Date.	Of Intermediate Date.	
			''	°	''	°	°	°	h m	h m	
Jan.	1	0.890	6.15	38.79	0.68	67.50	59.93	50.00	7 53.5	8 34.3	
	3	0.891	6.09	38.51	0.66	67.37	40.08	30.15	9 15.2	9 56.0	
	5	0.893	6.03	38.23	0.65	67.25	20.22	10.29	10 36.8	11 17.7	
	7	0.894	5.97	37.95	0.63	67.14	0.36	350.43	11 58.5	12 39.4	
	9	0.896	5.92	37.66	0.62	67.05	340.50	330.57	13 20.2	14 1.0	
	11	0.897	5.86	37.37	0.60	66.97	320.64	310.71	14 41.9	15 22.7	
	13	0.899	5.81	37.08	0.59	66.90	300.78	290.85	16 3.6	16 44.4	
	15	0.900	5.75	36.79	0.57	66.85	280.92	270.99	17 25.3	18 6.1	
	17	0.902	5.70	36.49	0.56	66.81	261.06	251.13	18 47.0	19 27.8	
	19	0.904	5.65	36.19	0.54	66.78	241.20	231.27	20 8.7	20 49.5	
	21	0.905	5.60	35.89	0.53	66.76	221.34	211.41	21 30.4	22 11.2	
	23	0.907	5.55	35.59	0.52	66.75	201.48	191.55	22 52.1	23 32.9	
	25	0.908	5.50	35.28	0.51	66.76	181.63	171.70	. . . . .	0 13.7
	27	0.910	5.45	34.97	0.49	66.79	161.78	151.85	0 54.6	1 35.4	
	29	0.911	5.41	34.66	0.48	66.82	141.93	132.01	2 16.2	2 57.0	
	31	0.913	5.36	34.35	0.47	66.87	122.09	112.17	3 37.8	4 18.6	
	Feb.	2	0.914	5.31	34.03	0.46	66.93	102.25	92.34	4 59.4	5 40.2
		4	0.916	5.27	33.72	0.44	67.00	82.42	72.51	6 21.0	7 1.8
		6	0.917	5.23	33.40	0.43	67.08	62.59	52.68	7 42.5	8 23.3
		8	0.919	5.18	33.08	0.42	67.18	42.77	32.87	9 4.1	9 44.8
	10	0.920	5.14	32.76	0.41	67.29	22.96	13.06	10 25.6	11 6.3	
	12	0.922	5.10	32.43	0.40	67.41	3.16	353.26	11 47.0	12 27.7	
	14	0.923	5.06	32.11	0.39	67.54	343.36	333.46	13 8.5	13 49.2	
	16	0.925	5.02	31.78	0.38	67.69	323.57	313.67	14 29.9	15 10.5	
	18	0.926	4.98	31.45	0.37	67.85	303.78	293.89	15 51.2	16 31.9	
	20	0.928	4.94	31.12	0.36	68.02	284.01	274.12	17 12.5	17 53.2	
	22	0.930	4.90	30.79	0.35	68.20	264.24	254.36	18 33.8	19 14.5	
	24	0.931	4.86	30.45	0.34	68.39	244.49	234.61	19 55.1	20 35.7	
	26	0.933	4.83	30.12	0.33	68.60	224.74	214.87	21 16.3	21 56.9	
	28	0.934	4.79	29.78	0.32	68.82	205.00	195.13	22 37.5	23 18.0	
Mar.	2	0.935	4.76	29.44	0.31	69.05	185.27	175.41	23 58.6	
	4	0.937	4.72	29.10	0.30	69.29	165.55	155.70	0 39.1	1 19.7	
	6	0.938	4.69	28.76	0.29	69.54	145.84	135.99	2 0.2	2 40.7	
	8	0.940	4.66	28.42	0.28	69.80	126.14	116.30	3 21.2	4 1.7	
		
Dec.	10	0.955	4.25	24.48	0.19	290.53	302.28	292.54	15 57.3	16 37.4	
	12	0.954	4.28	24.86	0.20	290.21	282.79	273.05	17 17.4	17 57.5	
	14	0.952	4.31	25.23	0.21	289.88	263.31	253.57	18 37.5	19 17.5	
	16	0.951	4.34	25.61	0.21	289.54	243.84	234.10	19 57.6	20 37.6	
	18	0.949	4.37	25.98	0.22	289.19	224.37	214.64	21 17.6	21 57.6	
	20	0.948	4.40	26.35	0.23	288.84	204.91	195.18	22 37.6	23 17.6	
	22	0.947	4.44	26.72	0.24	288.47	185.45	175.73	23 57.6	
	24	0.945	4.47	27.09	0.24	288.10	166.00	156.28	0 37.6	1 17.5	
	26	0.944	4.50	27.45	0.25	287.72	146.55	136.83	1 57.5	2 37.5	
	28	0.942	4.54	27.81	0.26	287.32	127.11	117.39	3 17.4	3 57.4	
	30	0.941	4.58	28.18	0.27	286.92	107.68	97.96	4 37.4	5 17.3	
	32	0.939	4.61	28.54	0.28	286.52	88.24	78.52	5 57.2	6 37.2	

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN MIDNIGHT.

Date.		Light- Time.	Stellar Magni- tude.	<i>P</i>	$A_{\oplus} + 180^{\circ}$	D_{\oplus}	$A_{\odot} + 180^{\circ}$	D_{\odot}
		m		°	°	°	°	°
Jan.	1	49.08	-1.4	18.26	87.58	-3.07	78.83	-3.01
	8	48.25	1.4	17.92	88.67	3.10	79.36	3.01
	15	47.38	1.5	17.61	89.66	3.13	79.90	3.02
	22	46.48	1.5	17.32	90.55	3.16	80.43	3.03
	29	45.55	1.5	17.07	91.32	3.19	80.96	3.03
Feb.	5	44.61	-1.6	16.86	91.97	-3.21	81.50	-3.04
	12	43.67	1.6	16.69	92.48	3.24	82.03	3.04
	19	42.73	1.7	16.56	92.85	3.26	82.56	3.04
	26	41.82	1.7	16.48	93.08	3.28	83.10	3.05
Mar.	5	40.94	1.8	16.46	93.15	3.30	83.63	3.05
	12	40.11	-1.8	16.48	93.06	-3.32	84.17	-3.05
	19	39.34	1.9	16.56	92.83	3.34	84.70	3.06
	26	38.65	1.9	16.69	92.45	3.35	85.24	3.06
Apr.	2	38.04	2.0	16.86	91.93	3.35	85.77	3.06
	9	37.53	2.0	17.07	91.29	3.36	86.31	3.06
	16	37.13	-2.0	17.31	90.55	-3.35	86.84	-3.06
	23	36.85	2.0	17.57	89.73	3.34	87.38	3.07
	30	36.68	2.0	17.85	88.86	3.33	87.92	3.07
May	7	36.64	2.0	18.12	87.97	3.31	88.45	3.07
	14	36.71	2.0	18.39	87.08	3.28	88.99	3.07
	21	36.91	-2.0	18.65	86.24	-3.25	89.53	-3.07
	28	37.23	2.0	18.88	85.46	3.22	90.06	3.07
June	4	37.65	2.0	19.08	84.78	3.19	90.60	3.07
	11	38.17	2.0	19.25	84.20	3.15	91.14	3.07
	18	38.78	1.9	19.38	83.76	3.12	91.68	3.07
	25	39.46	-1.9	19.47	83.45	-3.08	92.22	-3.07
July	2	40.21	1.8	19.52	83.28	3.05	92.75	3.07
	9	41.02	1.8	19.52	83.26	3.02	93.29	3.06
	16	41.86	1.8	19.49	83.39	2.99	93.83	3.06
	23	42.73	1.7	19.41	83.67	2.96	94.37	3.06
	30	43.62	-1.7	19.30	84.08	-2.94	94.91	-3.06
Aug.	6	44.51	1.6	19.14	84.63	2.92	95.45	3.06
	13	45.40	1.6	18.95	85.30	2.90	95.99	3.05
	20	46.27	1.5	18.72	86.09	2.89	96.53	3.05
	27	47.12	1.5	18.46	86.99	2.88	97.07	3.05
Sept.	3	47.94	-1.5	18.15	87.98	-2.87	97.62	-3.04
	10	48.71	1.4	17.82	89.07	2.86	98.16	3.04
	17	49.44	1.4	17.45	90.24	2.86	98.70	3.03
	24	50.11	1.4	17.04	91.49	2.85	99.24	3.03
Oct.	1	50.72	1.3	16.61	92.80	2.85	99.78	3.02
	8	51.26	-1.3	16.15	94.17	-2.85	100.33	-3.02
	15	51.73	1.3	15.66	95.59	2.85	100.87	3.01
	22	52.12	1.3	15.14	97.05	2.85	101.41	3.01
	29	52.43	-1.3	14.60	98.54	-2.85	101.96	-3.00
	
Dec.	25	51.75	-1.3	9.63	111.07	-2.84	106.40	-2.94
	32	51.28	-1.3	9.01	112.53	-2.84	106.95	-2.94

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

FOR GREENWICH MEAN MIDNIGHT.

Date.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	<i>i</i>	<i>q</i>	<i>Q</i>	Central Meridian.		Correction for Phase.
							System I.	System II.	
		"	"	°	"	°	°	°	°
Jan.	1	33.34	2.21	8.74	0.20	288.10	250.32	249.14	+0.33
	8	33.91	2.25	9.29	0.22	287.66	275.03	220.44	0.38
	15	34.53	2.29	9.75	0.25	287.24	299.87	191.86	0.41
	22	35.20	2.34	10.11	0.27	286.86	324.83	163.41	0.44
	29	35.92	2.39	10.35	0.29	286.50	349.93	135.09	0.46
Feb.	5	36.68	2.44	10.46	0.30	286.18	15.16	106.90	+0.47
	12	37.48	2.49	10.44	0.31	285.89	40.52	78.85	0.47
	19	38.30	2.54	10.28	0.31	285.63	66.02	50.93	0.46
	26	39.13	2.60	9.97	0.30	285.40	91.65	23.15	0.43
Mar.	5	39.97	2.65	9.50	0.28	285.20	117.41	355.50	0.39
	12	40.80	2.71	8.89	0.25	285.01	143.30	327.97	+0.34
	19	41.59	2.76	8.12	0.21	284.82	169.31	300.56	0.29
	26	42.34	2.81	7.21	0.17	284.60	195.41	273.25	0.23
Apr.	2	43.02	2.85	6.16	0.12	284.30	221.60	246.03	0.17
	9	43.60	2.89	4.98	0.08	283.84	247.85	218.86	0.11
	16	44.07	2.92	3.71	0.04	282.96	274.13	191.74	+0.06
	23	44.41	2.95	2.36	0.02	280.89	300.43	164.62	+0.02
	30	44.61	2.96	0.98	0.00	272.31	326.70	137.48	0.00
May	7	44.67	2.97	0.54	0.00	134.51	352.92	110.29	0.00
	14	44.57	2.96	1.92	0.01	114.80	19.06	83.02	-0.02
	21	44.33	2.94	3.29	0.04	111.80	45.08	55.63	-0.05
	28	43.96	2.92	4.60	0.07	110.67	70.96	28.11	0.09
June	4	43.47	2.89	5.82	0.11	110.09	96.69	0.43	0.15
	11	42.87	2.85	6.93	0.15	109.75	122.25	332.58	0.21
	18	42.20	2.80	7.91	0.20	109.52	147.63	304.55	0.27
	25	41.47	2.75	8.76	0.24	109.33	172.82	276.33	-0.33
July	2	40.69	2.70	9.46	0.28	109.16	197.82	247.94	0.39
	9	39.90	2.65	10.01	0.30	108.98	222.65	219.36	0.44
	16	39.09	2.60	10.42	0.32	108.80	247.31	190.61	0.47
	23	38.30	2.54	10.69	0.33	108.61	271.80	161.70	0.50
	30	37.52	2.49	10.81	0.33	108.39	296.15	132.63	-0.51
Aug.	6	36.76	2.44	10.81	0.33	108.14	320.36	103.44	0.51
	13	36.04	2.39	10.68	0.31	107.87	344.44	74.12	0.50
	20	35.36	2.35	10.43	0.29	107.57	8.42	44.69	0.47
	27	34.73	2.31	10.08	0.27	107.24	32.31	15.17	0.44
Sept.	3	34.14	2.27	9.62	0.24	106.88	56.11	345.58	-0.40
	10	33.59	2.23	9.08	0.21	106.47	79.85	315.91	0.36
	17	33.10	2.20	8.45	0.18	106.03	103.54	286.19	0.31
	24	32.66	2.17	7.75	0.15	105.55	127.19	256.43	0.26
Oct.	1	32.27	2.14	6.98	0.12	105.02	150.81	226.64	0.21
	8	31.93	2.12	6.16	0.09	104.42	174.41	196.84	-0.16
	15	31.64	2.10	5.28	0.07	103.75	198.00	167.02	0.12
	22	31.40	2.09	4.37	0.05	102.95	221.60	137.22	0.08
	29	31.21	2.07	3.42	0.03	101.96	245.22	107.42	-0.05
	
Dec.	25	31.62	2.10	4.66	0.05	281.01	233.40	20.69	+0.09
	32	31.91	2.12	5.58	0.08	280.15	257.53	351.41	+0.14

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM I.

GREENWICH MEAN TIME.

Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interval between Successive Transits.	
Jan.	d	h m	h	m	Apr.	d	h m	h	m	Aug.	d	h m	h	m
	1	14 59.38	9	50.55		18	5 42.36		9 50.41		2	20 30.41		9 50.61
	3	16 12.16				20	6 54.40				4	21 43.44		
	5	17 24.92				22	8 6.43				6	22 56.49		
	7	18 37.67				24	9 18.47				9	0 9.55		
	9	19 50.40				26	10 30.51				11	1 22.63		
	11	21 3.11	9	50.54		28	11 42.55	9	50.41		13	2 35.72	9	50.62
	13	22 15.81				30	12 54.60				15	3 48.82		
	15	23 28.49			May	2	14 6.65				17	5 1.94		
	18	0 41.15				4	15 18.71				19	6 15.08		
	20	1 53.80				6	16 30.78				21	7 28.22		
	22	3 6.43	9	50.52		8	17 42.86	9	50.42		23	8 41.38	9	50.63
	24	4 19.04				10	18 54.96				25	9 54.54		
	26	5 31.64				12	20 7.07				27	11 7.72		
	28	6 44.22				14	21 19.20				29	12 20.91		
	30	7 56.78				16	22 31.35				31	13 34.11		
Feb.	1	9 9.32	9	50.50		18	23 43.52	9	50.44	Sept.	2	14 47.31	9	50.64
	3	10 21.85				21	0 55.70				4	16 0.53		
	5	11 34.36				23	2 7.91				6	17 13.75		
	7	12 46.85				25	3 20.15				8	18 26.98		
	9	13 59.32				27	4 32.40				10	19 40.22		
	11	15 11.78	9	50.48		29	5 44.68	9	50.47		12	20 53.47	9	50.65
	13	16 24.22				31	6 56.98				14	22 6.72		
	15	17 36.64			June	2	8 9.30				16	23 19.98		
	17	18 49.05				4	9 21.65				19	0 33.24		
	19	20 1.44				6	10 34.02				21	1 46.51		
	21	21 13.81	9	50.47		8	11 46.42	9	50.49		23	2 59.79	9	50.66
	23	22 26.16				10	12 58.85				25	4 13.06		
	25	23 38.50				12	14 11.30				27	5 26.35		
	28	0 50.82				14	15 23.78				29	6 39.63		
Mar.	2	2 3.12				16	16 36.28			Cct.	1	7 52.92		
	4	3 15.41	9	50.45		18	17 48.81	9	50.52		3	9 6.21	9	50.66
	6	4 27.68				20	19 1.36				5	10 19.50		
	8	5 39.94				22	20 13.94				7	11 32.80		
	10	6 52.18				24	21 26.54				9	12 46.10		
	12	8 4.40				26	22 39.18				11	13 59.40		
	14	9 16.61	9	50.44		28	23 51.83	9	50.54		13	15 12.69	9	50.66
	16	10 28.80			July	1	1 4.51				15	16 25.99		
	18	11 40.98				3	2 17.22				17	17 39.29		
	20	12 53.15				5	3 29.94				19	18 52.59		
	22	14 5.30				7	4 42.69				21	20 5.89		
	24	15 17.44	9	50.42		9	5 55.47	9	50.57		23	21 19.19	9	50.66
	26	16 29.57				11	7 8.27				25	22 32.48		
	28	17 41.68				13	8 21.09				27	23 45.78		
	30	18 53.79				15	9 33.93				29	24 5.78		
Apr.	1	20 5.88				17	10 46.79				31	25 19.19		
	3	21 17.96	9	50.41		19	11 59.68	9	50.59	Dec.	20	7 29.53	9	50.62
	5	22 30.04				21	13 12.58				22	8 42.62		
	7	23 42.11				23	14 25.51				24	9 55.70		
	10	0 54.17				25	15 38.45				26	11 8.77		
	12	2 6.22				27	16 51.41				28	12 21.82		
	14	3 18.27	9	50.41		29	18 4.39	9	50.60		30	13 34.86	9	50.60
	16	4 30.32				31	19 17.39				32	14 47.89		

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER,
SYSTEM II.

GREENWICH MEAN TIME.

Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interval between Successive Transits.		Transit of Zero Meridian.			Interval between Successive Transits.				
Jan.	d	h	m	h	m	Apr.	d	h	m	h	m	Aug.	d	h	m	h	m
	1	15	2.91	9	55.73		19	4	11.78	9	55.58		4	17	26.50	9	55.79
	3	16	41.58				21	5	49.69				6	19	5.44		
	5	18	20.24				23	7	27.61				8	20	44.40		
	7	19	58.88				25	9	5.53				10	22	23.37		
	9	21	37.50				27	10	43.45				13	0	2.35		
	11	23	16.10	9	55.71		29	12	21.37	9	55.59		15	1	41.35	9	55.81
	14	0	54.69			May	1	13	59.29				17	3	20.37		
	16	2	33.26				3	15	37.23				19	4	59.39		
	18	4	11.81				5	17	15.17				21	6	38.43		
	20	5	50.35				7	18	53.13				23	8	17.48		
	22	7	28.87	9	55.70		9	20	31.09	9	55.60		25	9	56.54	9	55.82
	24	9	7.37				11	22	9.08				27	11	35.62		
	26	10	45.85				13	23	47.08				29	13	14.70		
	28	12	24.32				16	1	25.10			Sept.	31	14	53.79		
	30	14	2.77				18	3	3.13				2	16	32.90		
Feb.	1	15	41.20	9	55.68		20	4	41.19	9	55.62		4	18	12.01	9	55.83
	3	17	19.61				22	6	19.27				6	19	51.13		
	5	18	58.01				24	7	57.37				8	21	30.26		
	7	20	36.39				26	9	35.50				10	23	9.40		
	9	22	14.75				28	11	13.65				13	0	48.54		
	11	23	53.09	9	55.66		30	12	51.82	9	55.64		15	2	27.69	9	55.83
	14	1	31.41			June	1	14	30.02				17	4	6.85		
	16	3	9.72				3	16	8.24				19	5	46.01		
	18	4	48.00				5	17	46.49				21	7	25.17		
	20	6	26.27				7	19	24.76				23	9	4.35		
	22	8	4.53	9	55.64		9	21	3.06	9	55.67		25	10	43.52	9	55.84
	24	9	42.76				11	22	41.39				27	12	22.70		
	26	11	20.98				14	0	19.74				29	14	1.89		
	28	12	59.18				16	1	58.12			Oct.	1	15	41.07		
Mar.	2	14	37.36				18	3	36.52				3	17	20.26		
	4	16	15.53	9	55.63		20	5	14.95	9	55.70		5	18	59.46	9	55.84
	6	17	53.68				22	6	53.41				7	20	38.65		
	8	19	31.82				24	8	31.90				9	22	17.85		
	10	21	9.93				26	10	10.41				11	23	57.04		
	12	22	48.04				28	11	48.94				14	1	36.24		
	15	0	26.12	9	55.61		30	13	27.50	9	55.72		16	3	15.44	9	55.84
	17	2	4.19			July	2	15	6.09				18	4	54.64		
	19	3	42.25				4	16	44.70				20	6	33.84		
	21	5	20.29				6	18	23.33				22	8	13.03		
	23	6	58.32				8	20	1.99				24	9	52.23		
	25	8	36.34	9	55.60		10	21	40.67	9	55.75		26	11	31.42	9	55.84
	27	10	14.34				12	23	19.38				28	13	10.61		
	29	11	52.34				15	0	58.11				30	14	49.80		
	31	13	30.32				17	2	36.86				...	...	...
Apr.	2	15	8.29				19	4	15.63				...	...	...
	4	16	46.25	9	55.59		21	5	54.42	9	55.77	Dec.	20	2	20.25	9	55.80
	6	18	24.20				23	7	33.23				22	3	59.24		
	8	20	2.14				25	9	12.07				24	5	38.22		
	10	21	40.08				27	10	50.92				26	7	17.18		
	12	23	18.01				29	12	29.79				28	8	56.13		
	15	0	55.94	9	55.58		31	14	8.68	9	55.78		30	10	35.07	9	55.78
	17	2	33.86			Aug.	2	15	47.58				32	12	13.99		

SATELLITES OF JUPITER, 1923.

631

SATELLITE V.

GREENWICH MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

Feb.	d	h	E.	May	d	h	E.	Feb.	d	h	W.	May	d	h	W.
	9	13.4	E.		10	5.3	E.		19	19.4	W.		10	11.3	W.
	19	12.5	E.		20	4.4	E.		19	18.5	W.		20	10.4	W.
Mar.	1	11.6	E.		30	3.5	E.	Mar.	1	17.6	W.		30	9.4	W.
	11	10.8	E.	June	9	2.6	E.		11	16.7	W.	June	9	8.6	W.
	21	9.9	E.		19	1.7	E.		21	15.8	W.		19	7.7	W.
	31	8.9	E.		29	0.8	E.		31	14.9	W.		29	6.8	W.
Apr.	10	8.0	E.	July	9	0.0	E.	Apr.	10	14.0	W.	July	9	5.9	W.
	20	7.1	E.		18	23.1	E.		20	13.1	W.		19	5.1	W.
	30	6.2	E.		28	22.3	E.		30	12.2	W.		29	4.2	W.

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

Jan.	d	h	m	Mar.	d	h	m	June	d	h	m	Sept.	d	h	m
	2	1	37.3		24	11	8.1		13	19	11.9		3	4	54.4
	3	20	6.6		26	5	34.6		15	13	38.8		4	23	24.0
	5	14	35.9		28	0	1.1		17	8	5.7		6	17	53.7
	7	9	5.2		29	18	27.6		19	2	32.7		8	12	23.4
	9	3	34.4		31	12	54.0		20	20	59.8		10	6	53.1
	10	22	3.5	Apr.	2	7	20.3		22	15	26.8		12	1	22.9
	12	16	32.7		4	1	46.7		24	9	54.0		13	19	52.7
	14	11	1.8		5	20	12.9		26	4	21.2		15	14	22.6
	16	5	30.8		7	14	39.1		27	22	48.5		17	8	52.4
	17	23	59.8		9	9	5.3		29	17	15.9		19	3	22.4
	19	18	28.7		11	3	31.4	July	1	11	43.3		20	21	52.3
	21	12	57.5		12	21	57.5		3	6	10.9		22	16	22.4
	23	7	26.4		14	16	23.5		5	0	38.4		24	10	52.3
	25	1	55.1		16	10	49.4		6	19	6.1		26	5	22.4
	26	20	23.8		18	5	15.5		8	13	33.8		27	23	52.4
	28	14	52.4		19	23	41.5		10	8	1.7		29	18	22.6
	30	9	21.0		21	18	7.5		12	2	29.5	Oct.	1	12	52.6
Feb.	1	3	49.5		23	12	33.4		13	20	57.5		3	7	22.8
	2	22	18.0		25	6	59.3		15	15	25.5		5	1	53.0
	4	16	46.3		27	1	25.2		17	9	53.6		6	20	23.2
	6	11	14.7		28	19	51.1		19	4	21.7		8	14	53.3
	8	5	42.9		30	14	17.0		20	22	49.9		10	9	23.6
	10	0	11.2	May	2	8	42.8		22	17	18.2		12	3	53.9
	11	18	39.3		4	3	8.7		24	11	46.6		13	22	24.1
	13	13	7.4		5	21	34.6		26	6	14.9		15	16	54.4
	15	7	35.3		7	16	0.5		28	0	43.4		17	11	24.8
	17	2	3.3		9	10	26.4		29	19	11.9		19	5	55.0
	18	20	31.2		11	4	52.3		31	13	40.6		21	0	25.4
	20	14	59.0		12	23	18.3	Aug.	2	8	9.2		22	18	55.7
	22	9	26.7		14	17	44.3		4	2	37.9		24	13	26.1
	24	3	54.4		16	12	10.3		5	21	6.7		26	7	56.5
	25	22	22.0		18	6	36.3		7	15	35.6		28	2	26.9
	27	16	49.5		20	1	2.4		9	10	4.4		29	20	57.2
Mar.	1	11	17.0		21	19	28.4		11	4	33.4		31	15	27.7
	3	5	44.4		23	13	54.6		12	23	2.4	Nov.	2	9	58.1
	5	0	11.7		25	8	20.7		14	17	31.5		..	..	..
	6	18	39.0		27	2	46.9		16	12	0.6	Dec.	14	22	8.0
	8	13	6.2		28	21	13.2		18	6	29.7		16	16	38.3
	10	7	33.3		30	15	39.5		20	0	58.9		18	11	8.5
	12	2	0.4	June	1	10	5.9		21	19	28.2		20	5	38.8
	13	20	27.4		3	4	32.3		23	13	57.5		22	0	9.1
	15	14	54.3		4	22	58.8		25	8	26.8		23	18	39.3
	17	9	21.2		6	17	25.3		27	2	56.3		25	13	9.5
	19	3	48.0		8	11	51.8		28	21	25.8		27	7	39.7
	20	22	14.8		10	6	18.5		30	15	55.3		29	2	9.8
	22	16	41.4		12	0	45.2	Sept.	1	10	24.8		30	20	40.1

GREENWICH MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	3	8	7.3	Mar.	26	1	24.3	June	15	15	51.3	Sept.	5	9	29.4
	6	21	28.7		29	14	34.4		19	5	3.6		8	22	51.3
	10	10	49.2	Apr.	2	3	44.8		22	18	15.4		12	12	13.8
	14	0	9.7		5	16	54.0		26	7	28.7		16	1	36.2
	17	13	29.6		9	6	3.7		29	20	41.7		19	14	59.1
	21	2	49.4		12	19	12.2	July	3	9	56.0		23	4	22.0
	24	16	8.5		16	8	21.2		6	23	10.1		26	17	45.2
	28	5	27.5		19	21	29.1		10	12	25.6		30	7	8.4
	31	18	45.7		23	10	37.7		14	1	40.8	Oct.	3	20	31.9
Feb.	4	8	4.0		26	23	45.2		17	14	57.2		7	9	55.5
	7	21	21.3		30	12	53.6		21	4	13.5		10	23	19.2
	11	10	38.7	May	4	2	1.0		24	17	31.0		14	12	43.0
	14	23	55.1		7	15	9.4		28	6	48.3		18	2	6.9
	18	13	11.5		11	4	16.8		31	20	6.7		21	15	30.9
	22	2	26.8		14	17	25.4	Aug.	4	9	24.9		25	4	55.0
	25	15	42.2		18	6	33.1		7	22	44.2		28	18	19.0
Mar.	1	4	56.5		21	19	42.1		11	12	3.3	Nov.	1	7	43.2
	4	18	10.9		25	8	50.4		15	1	23.4		..	..	..
	8	7	24.1		28	22	0.0		18	14	43.3	Dec.	17	13	55.4
	11	20	37.5	June	1	11	9.0		22	4	4.1		21	3	18.9
	15	9	49.6		5	0	19.4		25	17	24.7		24	16	42.2
	18	23	1.9		8	13	29.2		29	6	46.2		28	6	5.4
	22	12	12.9		12	2	40.5	Sept.	1	20	7.5		31	19	28.5

SATELLITE III.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	7	17	59.5	Apr.	3	15	52.7	June	28	8	20.2	Sept.	22	8	41.3
	14	22	10.6		10	19	14.9	July	5	12	0.4		29	13	3.2
	22	2	19.1		17	22	34.8		12	15	44.8	Oct.	6	2	26.3
	29	6	23.5		25	1	52.5		19	19	33.4		13	21	50.8
Feb.	5	10	24.0	May	2	5	9.6		26	23	26.8		21	2	16.4
	12	14	20.3		9	8	25.9	Aug.	3	3	24.2		28	6	42.9
	19	18	12.2		16	11	42.7		10	7	26.2		..	..	..
	26	22	0.2		23	15	0.8		17	11	31.4		..	..	..
Mar.	6	1	43.5		30	18	21.2		24	15	39.8		..	..	..
	13	5	22.8	June	6	21	45.1		31	19	51.0	Dec.	17	14	0.1
	20	8	57.0		14	1	12.4	Sept.	8	0	5.0		24	18	27.3
	27	12	26.9		21	4	44.5		15	4	22.1		31	22	53.1

SATELLITE IV.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	10	21	0.1	Apr.	4	10	32.8	June	26	12	0.0	Sept.	18	6	34.4
	27	15	49.9		21	1	8.2	July	13	4	27.8	Oct.	5	2	34.3
Feb.	13	9	53.5	May	7	15	22.0		29	21	50.5		21	22	56.6
Mar.	2	3	2.7		24	5	40.4	Aug.	15	16	3.8		..	..	..
	18	19	14.6	June	9	20	27.2	Sept.	1	11	1.4	Dec.	28	9	21.4

DIFFERENTIAL COORDINATES OF SATELLITE VI.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Date.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 1	+0 28	-20.1	Apr. 11	-4 16	+11.7	July 20	+3 2	- 4.6
5	+0 13	20.6	15	4 8	13.8	24	2 59	7.0
9	-0 3	21.0	19	3 58	15.8	28	2 53	9.2
13	0 19	21.3	23	3 45	17.6	Aug. 1	2 44	11.3
17	0 36	21.3	27	3 30	19.2	5	2 34	13.1
21	-0 53	-21.2	May 1	-3 12	+20.7	9	+2 23	-14.7
25	1 10	20.9	5	2 51	21.9	13	2 10	16.1
29	1 27	20.5	9	2 29	22.8	17	1 56	17.4
Feb. 2	1 44	19.8	13	2 5	23.4	21	1 41	18.4
6	2 1	19.0	17	1 39	23.7	25	1 26	19.2
10	-2 17	-18.0	21	-1 13	+23.7	29	+1 10	-19.9
14	2 34	16.8	25	0 45	23.4	Sept. 2	0 54	20.4
18	2 49	15.5	29	-0 18	22.8	6	0 39	20.8
22	3 4	14.0	June 2	+0 10	21.8	10	0 23	21.0
26	3 18	12.3	6	0 36	20.6	14	+0 8	21.1
Mar. 2	-3 32	-10.5	10	+1 2	+19.0	18	-0 8	-21.0
6	3 44	8.6	14	1 25	17.2	22	0 22	20.8
10	3 55	6.6	18	1 47	15.3	26	0 37	20.5
14	4 4	4.4	22	2 6	13.1	30	0 50	20.0
18	4 12	- 2.2	26	2 23	10.7	Oct. 4	1 4	19.5
22	-4 18	+ 0.1	30	+2 38	+ 8.3	8	-1 16	-18.8
26	4 22	2.5	July 4	2 49	5.7	12	1 28	18.0
30	4 24	4.8	8	2 57	3.1	16	1 40	17.1
Apr. 3	4 24	7.2	12	3 2	+ 0.4	20	1 51	16.1
7	-4 21	+ 9.5	16	+3 3	- 2.1	24	-2 1	-15.0

DIFFERENTIAL COORDINATES OF SATELLITE VII.

Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Date.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	'		m s	'		m s	'
Jan. 1	-1 36	-5.7	Apr. 11	+2 23	+10.1	July 20	+2 39	+5.2
5	1 50	6.3	15	2 45	10.7	24	2 22	4.4
9	2 2	6.8	19	3 7	11.3	28	2 4	3.7
13	2 13	7.1	23	3 27	11.7	Aug. 1	1 46	2.9
17	2 23	7.3	27	3 45	12.0	5	1 28	2.1
21	-2 31	-7.4	May 1	+4 2	+12.3	9	+1 10	+1.2
25	2 36	7.4	5	4 16	12.5	13	0 52	+0.4
29	2 40	7.2	9	4 28	12.6	17	0 34	-0.5
Feb. 2	2 40	6.8	13	4 39	12.6	21	+0 16	1.4
6	2 38	6.2	17	4 47	12.6	25	-0 2	2.2
10	-2 33	-5.5	21	+4 52	+12.5	29	-0 19	-3.0
14	2 24	4.7	25	4 56	12.3	Sept. 2	0 35	3.8
18	2 14	3.8	29	4 57	12.1	6	0 51	4.6
-22	2 0	2.7	June 2	4 56	11.8	10	1 6	5.3
26	1 44	1.6	6	4 53	11.5	14	1 20	5.9
Mar. 2	-1 27	-0.4	10	+4 48	+11.0	18	-1 33	-6.4
6	1 7	+0.7	14	4 41	10.5	22	1 45	6.8
10	0 46	2.0	18	4 31	10.1	26	1 55	7.1
14	0 24	3.2	22	4 21	9.6	30	2 4	7.4
18	-0 1	4.4	26	4 9	9.0	Oct. 4	2 11	7.5
22	+0 23	+5.5	30	+3 56	+ 8.4	8	-2 16	-7.5
26	0 47	6.6	July 4	3 42	7.8	12	2 20	7.3
30	1 12	7.6	8	3 28	7.2	16	2 21	7.0
Apr. 3	1 36	8.5	12	3 12	6.6	20	2 20	6.5
7	+2 0	+9.3	16	+2 56	+ 5.9	24	-2 18	-5.8

GREENWICH MEAN TIME.

JANUARY.

d h m		d h m		d h m		d h m	
1 2 10	I. Sh. I.	9 23 38	I.*Tr. I.	18 12 53	III. Tr. E.	26 10 8	II. Tr. I.
3 11	I. Tr. I.			18 53	I. Sh. I.	12 25	II. Tr. E.
4 19	I. Sh. E.	10 0 41	I. Sh. E.	20 3	I.*Tr. I.	18 5.9	I. Ec. D.
5 20	I. Tr. E.	1 46	I. Tr. E.	21 2	I.*Sh. E.	21 28	I.*Oc. R.
10 40	II. Sh. I.	7 23.2	II. Ec. D.	22 11	I.*Tr. E.		
12 46	II. Tr. I.	11 59	II. Oc. R.			27 15 14	I. Sh. I.
13 3	II. Sh. E.	19 51.3	I. Ec. D.	19 5 7	II. Sh. I.	16 27	I. Tr. I.
15 6	II. Tr. E.	23 8	I.*Oc. R.	7 29	II. Sh. E.	17 23	I. Sh. E.
23 29.6	I.*Ec. D.			7 30	II. Tr. I.	18 35	I. Tr. E.
		11 2 32	III. Sh. I.	9 48	II. Tr. E.		
2 2 42	I. Oc. R.	4 19	III. Sh. E.	16 12.9	I. Ec. D.	28 1 48.6	II. Ec. D.
20 38	I.*Sh. I.	7 7	III. Tr. I.	19 33	I.*Oc. R.	4 11.9	II. Ec. R.
21 41	I.*Tr. I.	8 46	III. Tr. E.			4 18	II. Oc. D.
22 47	I.*Sh. E.	17 0	I. Sh. I.	20 13 21	I. Sh. I.	6 37	II. Oc. R.
23 49	I.*Tr. E.	18 7	I. Tr. I.	14 32	I. Tr. I.	12 34.3	I. Ec. D.
		19 9	I. Sh. E.	15 30	I. Sh. E.	15 57	I. Oc. R.
3 4 49.4	II. Ec. D.	20 15	I.*Tr. E.	16 40	I. Tr. E.		
9 18	II. Oc. R.			23 14.4	II.*Ec. D.	29 0 32.3	III. Ec. D.
17 57.9	I. Ec. D.	12 2 32	II. Sh. I.			2 19.6	III. Ec. R.
21 11	I.*Oc. R.	4 49	II. Tr. I.	21 1 37.8	II. Ec. R.	5 38	III. Oc. D.
22 35	III.*Sh. I.	4 55	II. Sh. E.	1 40	II. Oc. D.	7 9	III. Oc. R.
		7 8	II. Tr. E.	3 59	II. Oc. R.	9 43	I. Sh. I.
4 0 22	III. Sh. E.	14 19.7	I. Ec. D.	10 41.1	I. Ec. D.	10 56	I. Tr. I.
2 53	III. Tr. I.	17 37	I. Oc. R.	14 2	I. Oc. R.	11 52	I. Sh. E.
4 35	III. Tr. E.			20 34.7	III.*Ec. D.	13 4	I. Tr. E.
15 7	I. Sh. I.	13 11 28	I. Sh. I.	22 22.5	III.*Ec. R.	20 58	II.*Sh. I.
16 10	I. Tr. I.	12 36	I. Tr. I.			23 20	II.*Sh. E.
17 16	I. Sh. E.	13 37	I. Sh. E.	22 1 32	III. Oc. D.	23 27	II.*Tr. I.
18 19	I. Tr. E.	14 44	I. Tr. E.	3 6	III. Oc. R.		
23 57	II.*Sh. I.	20 40.3	II.*Ec. D.	7 50	I. Sh. I.	30 1 43	II. Tr. E.
				9 1	I. Tr. I.	7 2.6	I. Ec. D.
5 2 7	II. Tr. I.	14 1 20	II. Oc. R.	9 59	I. Sh. E.	10 25	I. Oc. R.
2 20	II. Sh. E.	8 47.9	I. Ec. D.	11 9	I. Tr. E.		
4 27	II. Tr. E.	12 6	I. Oc. R.	18 24	II. Sh. I.	31 4 11	I. Sh. I.
12 26.4	I. Ec. D.	16 36.6	III. Ec. D.	20 46	II.*Sh. E.	5 24	I. Tr. I.
15 41	I. Oc. R.	18 24.7	III. Ec. R.	20 49	II.*Tr. I.	6 20	I. Sh. E.
		21 22	III.*Oc. D.	23 7	II.*Tr. E.	7 32	I. Tr. E.
6 9 35	I. Sh. I.	23 0	III.*Oc. R.			15 5.5	II. Ec. D.
10 39	I. Tr. I.			23 5 9.5	I. Ec. D.	17 28.8	II. Ec. R.
11 44	I. Sh. E.	15 5 57	I. Sh. I.	8 31	I. Oc. R.	17 37	II. Oc. D.
12 48	I. Tr. E.	7 5	I. Tr. I.			19 55	II.*Oc. R.
18 6.4	II. Ec. D.	8 5	I. Sh. E.	24 2 18	I. Sh. I.		
22 39	II.*Oc. R.	9 13	I. Tr. E.	3 29	I. Tr. I.		
		15 50	II. Sh. I.	4 27	I. Sh. E.		
7 6 54.6	I. Ec. D.	18 10	II. Tr. I.	5 38	I. Tr. E.		
10 10	I. Oc. R.	18 12	II. Sh. E.	12 31.3	II. Ec. D.		
12 39.0	III. Ec. D.	20 28	II.*Tr. E.	14 54.7	II. Ec. R.		
14 27.6	III. Ec. R.			14 59	II. Oc. D.		
17 9	III. Oc. D.	16 3 16.3	I. Ec. D.	17 18	II. Oc. R.		
18 50	III. Oc. R.	6 36	I. Oc. R.	23 37.7	I.*Ec. D.		
8 4 3	I. Sh. I.	17 0 25	I. Sh. I.	25 3 0	I. Oc. R.		
5 8	I. Tr. I.	1 34	I. Tr. I.	10 26	III. Sh. I.		
6 12	I. Sh. E.	2 34	I. Sh. E.	12 12	III. Sh. E.		
7 17	I. Tr. E.	3 42	I. Tr. E.	15 25	III. Tr. I.		
13 15	II. Sh. I.	9 57.2	II. Ec. D.	16 57	III. Tr. E.		
15 29	II. Tr. I.	14 39	II. Oc. R.	20 46	I.*Sh. I.		
15 38	II. Sh. E.	21 44.5	I.*Ec. D.	21 58	I.*Tr. I.		
17 48	II. Tr. E.			22 55	I.*Sh. E.		
		18 1 4	I. Oc. R.				
9 1 23.0	I. Ec. D.	6 29	III. Sh. I.	26 0 6	I. Tr. E.		
4 39	I. Oc. R.	8 16	III. Sh. E.	7 41	II. Sh. I.		
22 32	I.*Sh. I.	11 18	III. Tr. I.	10 3	II. Sh. E.		

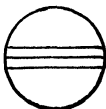
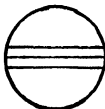
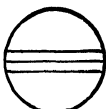
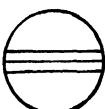
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	[*] d		III.	[*] d [*] r	
II.	[*] d		IV. No Eclipse.		

Configurations at 21^h 45^m for an Inverting Telescope.

Day.	West.				East.			
1			2. 1	○ 4.		3		
2	○ 1.		2.	○ 4.		3.		
3			4.	○ 3.		2		
4		4.	3.	1. ○ 2.				
5		4.	3.	2. ○ 1.				
6		4.	3. 1.	○				2 ●
7		4.		○ 3. 1. 2.				
8		4.	1.	○ 2.		3		
9			4. 2.	○ 1.		3.		
10				○ 4.		3. 2.		1 ●
11			3. 1.	○ 2.		4		
12		3.	2.	○ 1.		4		
13		3.	1.	○		4		2 ●
14				○ 1. 2.		4		3 ●
15			1. 2.	○		3		4.
16			2.	○ 1.		3.		4.
17				○ 2. 3.		4.		1 ●
18	○ 1.		3.	○ 4. 2.				
19		3.	2. 4.	○ 1.				
20		4. 3.	1. 2.	○				
21		4.		○ 1. 2.				3 ●
22	○ 2.	4.	1.	○		3		
23		4.	2.	○ 1.		3.		
24		4.	1.	○ 2. 3.				
25		4.	3.	○ 1.		2.		
26		3.	2. 4.	○ 1.				
27		3.	2. 1.	○ 4.				
28			3.	○ 1. 2. 4.				
29			1. 2.	○ 3.		4		
30			2.	○ 1.		3.		4
31			1.	○ 2.		3.		4.

GREENWICH MEAN TIME.

FEBRUARY.

d h m		d h m		d h m		d h m	
1 130.8	I. Ec. D.	9 1 46	I. Tr. I.	17 3 8	I. Oc. R.	25 14 34	II. Oc. D.
4 54	I. Oc. R.	2 41	I. Sh. E.	20 54	I.*Sh. I.	16 50	II. Oc. R.
14 24	III. Sh. I.	3 54	I. Tr. E.	22 7	I.*Tr. I.	20 6.6	I.*Ec. D.
16 10	III. Sh. E.	12 49	II. Sh. I.	23 3	I.*Sh. E.	23 26	I. Oc. R.
19 30	III.*Tr. I.	15 11	II. Sh. E.				
20 58	III.*Tr. E.	15 19	II. Tr. I.	18 0 15	I. Tr. E.	26 16 21.1	III. Ec. D.
22 40	I.*Sh. I.	17 34	II. Tr. E.	9 32.0	II. Ec. D.	17 16	I.*Sh. I.
23 53	I. Tr. I.	21 52.3	I.*Ec. D.	11 54.9	II. Ec. R.	18 7.3	III.*Ec. R.
				12 3	II. Oc. D.	18 26	I.*Tr. I.
2 0 48	I. Sh. E.	10 1 15	I. Oc. R.	14 20	II. Oc. R.	19 25	I.*Sh. E.
2 1	I. Tr. E.	19 1	I.*Sh. I.	18 13.6	I.*Ec. D.	20 34	I.*Tr. E.
10 15	II. Sh. I.	20 15	I.*Tr. I.	21 35	I.*Oc. R.	21 22	III.*Oc. D.
12 37	II. Sh. E.	21 10	I.*Sh. E.			22 39	III.*Oc. R.
12 45	II. Tr. I.	22 22	I.*Tr. E.	19 12 23.8	III. Ec. D.		
15 1	II. Tr. E.			14 10.1	III. Ec. R.	27 7 14	II. Sh. I.
19 59.2	I.*Ec. D.	11 6 57.4	II. Ec. D.	15 22	I. Sh. I.	9 34	II. Sh. E.
23 22	I.*Oc. R.	9 20.4	II. Ec. R.	16 35	I. Tr. I.	9 36	II. Tr. I.
		9 30	II. Oc. D.	17 31	I. Sh. E.	11 49	II. Tr. E.
3 17 8	I. Sh. I.	11 47	II. Oc. R.	17 32	III. Oc. D.	14 34.9	I. Ec. D.
18 21	I. Tr. I.	16 20.5	I. Ec. D.	18 43	I.*Tr. E.	17 54	I.*Oc. R.
19 17	I.*Sh. E.	19 44	I.*Oc. R.	18 52	III.*Oc. R.		
20 29	I.*Tr. E.					28 11 44	I. Sh. I.
		12 8 26.7	III. Ec. D.	20 4 40	II. Sh. I.	12 54	I. Tr. I.
4 4 22.9	II. Ec. D.	10 13.4	III. Ec. R.	7 1	II. Sh. E.	13 53	I. Sh. E.
6 46.1	II. Ec. R.	13 29	I. Sh. I.	7 7	II. Tr. I.	15 1	I. Tr. E.
6 55	II. Oc. D.	13 38	III. Oc. D.	9 21	II. Tr. E.		
9 13	II. Oc. R.	14 43	I. Tr. I.	12 41.8	I. Ec. D.		
14 27.4	I. Ec. D.	15 2	III. Oc. R.	16 3	I. Oc. R.		
17 51	I. Oc. R.	15 38	I. Sh. E.				
		16 51	I. Tr. E.	21 9 51	I. Sh. I.		
5 4 29.7	III. Ec. D.			11 3	I. Tr. I.		
6 16.8	III. Ec. R.	13 2 6	II. Sh. I.	12 0	I. Sh. E.		
9 40	III. Oc. D.	4 27	II. Sh. E.	13 10	I. Tr. E.		
11 8	III. Oc. R.	4 36	II. Tr. I.	22 49.2	II.*Ec. D.		
11 36	I. Sh. I.	6 51	II. Tr. E.				
12 50	I. Tr. I.	10 48.8	I. Ec. D.	22 1 12.0	II. Ec. R.		
13 45	I. Sh. E.	14 12	I. Oc. R.	1 19	II. Oc. D.		
14 58	I. Tr. E.			3 35	II. Oc. R.		
23 33	II.*Sh. I.	14 7 58	I. Sh. I.	7 10.1	I. Ec. D.		
		9 11	I. Tr. I.	10 31	I. Oc. R.		
6 1 54	II. Sh. E.	10 6	I. Sh. E.				
2 2	II. Tr. I.	11 19	I. Tr. E.	23 2 17	III. Sh. I.		
4 18	II. Tr. E.	20 14.5	II.*Ec. D.	4 1	III. Sh. E.		
8 55.7	I. Ec. D.	22 37.4	II.*Ec. R.	4 19	I. Sh. I.		
12 19	I. Oc. R.	22 47	II.*Oc. D.	5 31	I. Tr. I.		
				6 28	I. Sh. E.		
7 6 4	I. Sh. I.	15 1 3	II. Oc. R.	7 20	III. Tr. I.		
7 18	I. Tr. I.	5 17.0	I. Ec. D.	7 38	I. Tr. E.		
8 13	I. Sh. E.	8 40	I. Oc. R.	8 37	III. Tr. E.		
9 26	I. Tr. E.	22 19	III.*Sh. I.	17 57	II.*Sh. I.		
17 39.9	II. Ec. D.			20 18	II.*Sh. E.		
20 3.0	II.*Ec. R.	16 0 4	III. Sh. E.	20 22	II.*Tr. I.		
20 13	II.*Oc. D.	2 26	I. Sh. I.	22 35	II.*Tr. E.		
22 30	II.*Oc. R.	3 28	III. Tr. I.				
		3 39	I. Tr. I.	24 1 38.4	I. Ec. D.		
8 3 24.0	I. Ec. D.	4 35	I. Sh. E.	4 59	I. Oc. R.		
6 47	I. Oc. R.	4 48	III. Tr. E.	22 47	I.*Sh. I.		
18 22	III.*Sh. I.	5 47	I. Tr. E.	23 58	I. Tr. I.		
20 7	III.*Sh. E.	15 23	II. Sh. I.				
23 31	III.*Tr. I.	17 44	II. Sh. E.	25 0 56	I. Sh. E.		
		17 52	II. Tr. I.	2 6	I. Tr. E.		
9 0 33	I. Sh. I.	20 6	II.*Tr. E.	12 6.9	II. Ec. D.		
0 55	III. Tr. E.	23 45.3	I. Ec. D.	14 29.6	II. Ec. R.		

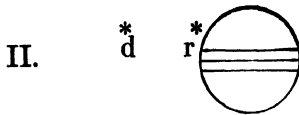
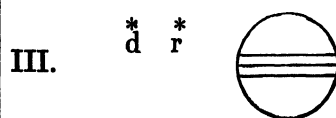
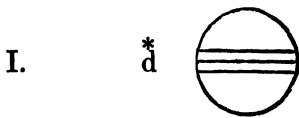
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

FEBRUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 20^h 45^m for an Inverting Telescope.

Day.	West.				East.			
1	○ 3.				○ 1.	2.	4.	
2		3.	2.	○		4.		•1 ●
3		•3	•2	1. ○		4.		
4			•3	4. ○	•1	•2		
5			4.	1.	○	2.	•3	
6		4.	2.	○	•1	•3		
7		4.		•1	○	3.		•2 ●
8		4.		3. ○	•1	2.		
9		•4	3.	2. •1 ○				
10	○ 1.	•4	•3	•2	○			
11		•4	•3	○	•1	•2		
12			•4	1. ○	•3	2.		
13			2.	○	•4	•1	•3	
14			1.	○		3.	•4	•2 ●
15				○	3.	•1	•2	•4
16			3.	•1	2. ○		•4	
17		3.	•2	1. ○	•		4.	
18			•3	○	•2		4.	•1 ●
19				1.	○	•3	2.	4.
20			2.	○	•1	4.	•3	
21			1.	•2	4. ○		3.	
22			4.	○	1.	3.	•2	
23	○ 2.	4.	3.	•1	○			
24		4.	3.	•2	○	1.		
25		4.	•3	○	•2			•1 ●
26		•4		•3	○	2.		
27		•4	2.	○	•1	•3		
28		•4	•2	1. ○		3.		

GREENWICH MEAN TIME.

MARCH.

d	h	m		d	h	m		d	h	m		d	h	m		d	h	m	
1	1	24.1	II. Ec. D.	9	10	15	I. Sh. E.	17	7	17.5	I. Ec. D.	26	3	38.9	I. Ec. D.				
	3	46.7	II. Ec. R.		11	18	I. Tr. E.		10	25	I. Oc. R.		6	38	I. Oc. R.				
	3	49	II. Oc. D.		11	55	III. Sh. E.												
	6	4	II. Oc. R.		14	49	III. Tr. I.	18	4	27	I. Sh. I.	27	0	49	I. Sh. I.				
	9	3.1	I. Ec. D.		16	0	III. Tr. E.		5	26	I. Tr. I.		1	40	I. Tr. I.				
	12	21	I. Oc. R.		23	4	II. Sh. I.		6	36	I. Sh. E.		2	59	I. Sh. E.				
									7	34	I. Tr. E.		3	48	I. Tr. E.				
2	6	12	I. Sh. I.	10	1	13	II. Tr. I.		19	52.6	II.*Ec. D.		8	11.5	III. Ec. D.				
	6	14	III. Sh. I.		1	24	II. Sh. E.						9	56.8	III. Ec. R.				
	7	21	I. Tr. I.		3	28	II. Tr. E.	19	0	9	II. Oc. R.		11	54	III. Oc. D.				
	7	58	III. Sh. E.		5	24.4	I. Ec. D.		1	45.8	I. Ec. D.		13	0	III. Oc. R.				
	8	21	I. Sh. E.		8	37	I. Oc. R.		4	52	I. Oc. R.		17	27	II.*Sh. I.				
	9	29	I. Tr. E.						22	56	I. Sh. I.		19	9	II.*Tr. I.				
	11	7	III. Tr. I.	11	2	34	I. Sh. I.		23	53	I. Tr. I.		19	47	II.*Sh. E.				
	12	20	III. Tr. E.		3	38	I. Tr. I.						21	21	II.*Tr. E.				
	20	31	II.*Sh. I.		4	43	I. Sh. E.	20	1	5	I. Sh. E.		22	7.2	I.*Ec. D.				
	22	49	II.*Tr. I.		5	46	I. Tr. E.		2	1	I. Tr. E.								
	22	51	II.*Sh. E.		17	17.1	II.*Ec. D.		4	13.9	III. Ec. D.	28	1	5	I. Oc. R.				
					21	45	II.*Oc. R.		5	59.5	III. Ec. R.		19	17	I.*Sh. I.				
3	1	3	II. Tr. E.		23	52.7	I. Ec. D.		8	23	III. Oc. D.		20	7	I.*Tr. I.				
	3	31.4	I. Ec. D.						9	31	III. Oc. R.		21	27	I.*Sh. E.				
	6	48	I. Oc. R.	12	3	4	I. Oc. R.		14	54	II. Sh. I.		22	14	I.*Tr. E.				
					21	2	I.*Sh. I.		16	49	II.*Tr. I.								
4	0	41	I. Sh. I.		22	5	I.*Tr. I.		17	14	II.*Sh. E.	29	11	45.7	II. Ec. D.				
	1	49	I. Tr. I.		23	11	I. Sh. E.		19	1	II.*Tr. E.		15	41	II.*Oc. R.				
	2	50	I. Sh. E.						20	14.1	I.*Ec. D.		16	35.5	I.*Ec. D.				
	3	56	I. Tr. E.	13	0	13	I. Tr. E.		23	19	I. Oc. R.		19	31	I.*Oc. R.				
	14	41.9	II. Ec. D.		0	16.5	III. Ec. D.	21	17	24	I.*Sh. I.	30	13	46	I. Sh. I.				
	19	18	II.*Oc. R.		2	2.2	III. Ec. R.		18	20	I.*Tr. I.		14	33	I. Tr. I.				
	21	59.6	I.*Ec. D.		4	48	III. Oc. D.		19	33	I.*Sh. E.		15	55	I.*Sh. E.				
					5	58	III. Oc. R.		20	28	I.*Tr. E.		16	41	I.*Tr. E.				
5	1	16	I. Oc. R.		12	21	II. Sh. I.		20	28			22	4	III. Sh. I.				
	19	9	I.*Sh. I.		14	27	II. Tr. I.	22	9	10.0	II. Ec. D.		23	48	III. Sh. E.				
	20	16	I.*Tr. I.		14	41	II. Sh. E.		13	20	II. Oc. R.								
	20	18.5	III.*Ec. D.		16	39	II.*Tr. E.		14	42.3	I. Ec. D.	31	1	31	III. Tr. I.				
	21	18	I.*Sh. E.		18	21.0	I.*Ec. D.		17	45	I.*Oc. R.		2	34	III. Tr. E.				
	22	4.4	III.*Ec. R.		21	31	I.*Oc. R.						6	44	II. Sh. I.				
	22	24	I.*Tr. E.										8	18	II. Tr. I.				
				14	15	30	I. Sh. I.	23	11	52	I. Sh. I.		9	4	II. Sh. E.				
6	1	7	III. Oc. D.		16	32	I.*Tr. I.		12	47	I. Tr. I.		10	30	II. Tr. E.				
	2	20	III. Oc. R.		17	40	I.*Sh. E.		14	2	I. Sh. E.		11	3.8	I. Ec. D.				
	9	47	II. Sh. I.		18	40	I.*Tr. E.		14	54	I. Tr. E.		13	58	I. Oc. R.				
	12	3	II. Tr. I.						18	6	III.*Sh. I.								
	12	8	II. Sh. E.	15	6	34.5	II. Ec. D.		19	50	III.*Sh. E.								
	14	15	II. Tr. E.		10	57	II. Oc. R.		22	2	III.*Tr. I.								
	16	27.9	I. Ec. D.		12	49.2	I. Ec. D.		23	6	III. Tr. E.								
	19	43	I.*Oc. R.		15	58	I. Oc. R.	24	4	11	II. Sh. I.								
									5	59	II. Tr. I.								
7	13	37	I. Sh. I.	16	9	59	I. Sh. I.		6	31	II. Sh. E.								
	14	43	I. Tr. I.		10	59	I. Tr. I.		8	11	II. Tr. E.								
	15	46	I. Sh. E.		12	8	I. Sh. E.		9	10.7	I. Ec. D.								
	16	51	I.*Tr. E.		13	7	I. Tr. E.		12	12	I. Oc. R.								
					14	8	III. Sh. I.												
					15	52	III. Sh. E.												
8	3	59.2	II. Ec. D.		18	27	III.*Tr. I.	25	6	21	I. Sh. I.								
	8	31	II. Oc. R.		19	35	III.*Tr. E.		7	13	I. Tr. I.								
	10	56.2	I. Ec. D.						8	30	I. Sh. E.								
	14	10	I. Oc. R.						9	21	I. Tr. E.								
				17	1	37	II. Sh. I.		22	28.2	II.*Ec. D.								
9	8	6	I. Sh. I.		3	38	II. Tr. I.												
	9	11	I. Tr. I.		3	58	II. Sh. E.	26	2	31	II. Oc. R.								
	10	11	III. Sh. I.		5	51	II. Tr. E.												

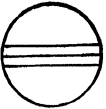

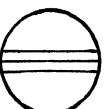

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.	^{*d} 	III.	^{*d} ^{*r} 
II.	^{*d} 	IV. No Eclipse.	

Configurations at 19^h 30^m for an Inverting Telescope.

Day.	West.	East.
1		•4 ○ •1 •3
2		•1 •3 ○ 2 •4
3	3 • 2 •	○ 1 • •4
4	•3	•1 ○ •2 •4
5		•3 1 ○ •2 •4
6		2 • ○ •3 4 • •1 ●
7		•2 1 • ○ •3 4 •
8		○ •1 •23 • 4 •
9		1 • 3 • ○ 2 •4 •
10	3 • 2 • 4 •	○ 1 •
11	•3 •4	•1 ○ •2 ●
12	4 •	•3 ○ 1 • 2 •
13	4 •	2 • ○ •3 •1 ●
14	•4	•2 1 • ○ •3
15	•4	○ •1 •2 3 •
16	○ 3 • •4	1 • ○ 2 •
17		3 • •4 •2 ○ •1
18		•3 •1 •2 ○ •4
19		•3 ○ 1 • •2 •4
20		•1 •2 ○ •3 •4
21	○ 1 •	•2 ○ •3 •4
22		○ •1 •2 3 • •4
23		1 • 3 ○ •2 • 4 •
24		3 • 2 • ○ •1 •4 •
25		•3 •1 •2 ○ •4 •
26		•3 ○ 4 • 1 • •2
27	○ 2 •	4 • •1 ○ •3
28		4 • •2 1 ○ •3
29	4 •	○ •2 3 • •1 ●
30	4 •	1 • ○ 3 • 2 •
31	•4	3 • 2 • ○ •1

GREENWICH MEAN TIME.

APRIL.

d h m		d h m		d h m		d h m	
1 8 14	I. Sh. I.	10 5 12	I. Tr. I.	18 3 47.2	I. Ec. D.	27 21 21	I.*Sh. I.
9 0	I. Tr. I.	6 46	I. Sh. E.	4 11	II. Tr. E.	21 32	I.*Tr. I.
10 24	I. Sh. E.	7 19	I. Tr. E.	6 19	I. Oc. R.	23 31	I. Sh. E.
11 7	I. Tr. E.	16 5.9	III.*Ec. D.			23 41	I. Tr. E.
		17 51.1	III.*Ec. R.	19 0 59	I. Sh. I.		
2 1 4.0	II. Ec. D.	18 43	III.*Oc. D.	1 22	I. Tr. I.	28 13 55	III.*Sh. I.
4 52	II. Oc. R.	19 47	III.*Oc. R.	3 9	I. Sh. E.	14 52	III.*Tr. I.
5 32.1	I. Ec. D.	22 34	II. Sh. I.	3 30	I. Tr. E.	15 39	III.*Sh. E.
8 24	I. Oc. R.	23 43	II. Tr. I.	19 34.0	II.*Ec. D.	15 58	III.*Tr. E.
				22 15.5	I. Ec. D.	16 58	II.*Sh. I.
3 2 43	I. Sh. I.	11 0 54	II. Sh. E.	22 36	II. Oc. R.	17 19	II.*Tr. I.
3 26	I. Tr. I.	1 53.8	I. Ec. D.			18 37.4	I.*Ec. D.
4 52	I. Sh. E.	1 56	II. Tr. E.	20 0 45	I. Oc. R.	19 17	II.*Sh. E.
5 34	I. Tr. E.	4 35	I. Oc. R.	19 27	I.*Sh. I.	19 32	II.*Tr. E.
12 8.7	III. Ec. D.	23 5	I. Sh. I.	19 48	I.*Tr. I.	20 55	I.*Oc. R.
13 53.9	III. Ec. R.	23 38	I. Tr. I.	21 37	I.*Sh. E.		
15 21	III.*Oc. D.			21 57	I. Tr. E.	29 15 50	I.*Sh. I.
16 25	III.*Oc. R.	12 1 15	I. Sh. E.			15 58	I.*Tr. I.
20 1	II.*Sh. I.	1 46	I. Tr. E.	21 9 57	III. Sh. I.	18 0	I.*Sh. E.
21 27	II.*Tr. I.	16 57.7	II.*Ec. D.	11 36	III. Tr. I.	18 7	I.*Tr. E.
22 21	II.*Sh. E.	20 19	II.*Oc. R.	11 42	III. Sh. E.		
23 39	II. Tr. E.	20 22.1	I.*Ec. D.	12 39	III. Tr. E.	30 11 29.3	II. Ec. D.
		23 1	I. Oc. R.	14 24	II.*Sh. I.	13 5.9	I.*Ec. D.
4 0 0.4	I. Ec. D.			15 5	II.*Tr. I.	14 1	II.*Oc. R.
2 50	I. Oc. R.	13 17 33	I.*Sh. I.	16 43.9	I.*Ec. D.	15 21	I.*Oc. R.
21 11	I.*Sh. I.	18 4	I.*Tr. I.	16 44	II.*Sh. E.		
21 53	I.*Tr. I.	19 43	I.*Sh. E.	17 18	II.*Tr. E.		
23 21	I. Sh. E.	20 12	I.*Tr. E.	19 10	I.*Oc. R.		
5 0 0	I. Tr. E.	14 6 0	III. Sh. I.	22 13 56	I.*Sh. I.		
14 21.6	II. Ec. D.	7 44	III. Sh. E.	14 14	I.*Tr. I.		
18 1	II.*Oc. R.	8 18	III. Tr. I.	16 6	I.*Sh. E.		
18 28.8	I.*Ec. D.	9 20	III. Tr. E.	16 23	I.*Tr. E.		
21 17	I.*Oc. R.	11 51	II. Sh. I.				
		12 51	II. Tr. I.	23 8 52.7	II. Ec. D.		
6 15 39	I.*Sh. I.	14 11	II.*Sh. E.	11 12.3	I. Ec. D.		
16 19	I.*Tr. I.	14 50.5	I.*Ec. D.	11 45	II. Oc. R.		
17 49	I.*Sh. E.	15 3	II.*Tr. E.	13 37	I.*Oc. R.		
18 27	I.*Tr. E.	17 27	I.*Oc. R.				
7 2 2	III. Sh. I.	15 12 2	I. Sh. I.	24 8 24	I. Sh. I.		
3 46	III. Sh. E.	12 30	I. Tr. I.	8 40	I. Tr. I.		
4 57	III. Tr. I.	14 12	I.*Sh. E.	10 34	I. Sh. E.		
5 59	III. Tr. E.	14 38	I.*Tr. E.	10 49	I. Tr. E.		
9 17	II. Sh. I.						
10 35	II. Tr. I.	16 6 16.3	II. Ec. D.	25 0 1.6	III. Ec. D.		
11 37	II. Sh. E.	9 18.8	I. Ec. D.	2 26	III. Oc. R.		
12 47	II. Tr. E.	9 28	II. Oc. R.	3 41	II. Sh. I.		
12 57.1	I. Ec. D.	11 53	I. Oc. R.	4 12	II. Tr. I.		
15 43	I.*Oc. R.			5 40.7	I. Ec. D.		
				6 1	II. Sh. E.		
8 10 8	I. Sh. I.	17 6 30	I. Sh. I.	6 25	II. Tr. E.		
10 45	I. Tr. I.	6 56	I. Tr. I.	8 3	I. Oc. R.		
12 18	I. Sh. E.	8 40	I. Sh. E.				
12 53	I. Tr. E.	9 4	I. Tr. E.	26 2 53	I. Sh. I.		
		20 3.8	III.*Ec. D.	3 6	I. Tr. I.		
		21 48.9	III.*Ec. R.	5 3	I. Sh. E.		
9 3 40.0	II. Ec. D.	22 3	III. Oc. D.	5 15	I. Tr. E.		
7 11	II. Oc. R.	23 7	III. Oc. R.	22 10.5	II. Ec. D.		
7 25.4	I. Ec. D.						
10 9	I. Oc. R.	18 1 7	II. Sh. I.	27 0 9.0	I. Ec. D.		
		1 58	II. Tr. I.	0 52	II. Oc. R.		
10 4 36	I. Sh. I.	3 27	II. Sh. E.	2 29	I. Oc. R.		

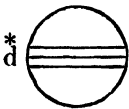
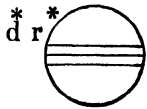

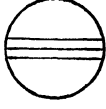
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 18^h 0^m for an Inverting Telescope.

Day.	West.	East
1	•4 3• •2 ₁ ○	
2	•4 •3 ○	1• •2
3	•4 ₁ ○	•3 ₂
4	2• ○	•4 ₁ •3
5	• •1 ○	•4 ₃ •2●
6	○1•	○ 3• 2• •4
7	3• 2• ○	•1 •4
8	3• •2 ₁ ○	4•
9	•3 •1 ○	•2 ₁ 4•
10	•1 ○	2• 4•
11	2• ○	1• 4• •3
12	•1 ○	3• •2●
13	4• ○	3• ₂ •1 ₁
14	4• 3• 2• ○	•1
15	4• 3• •2 1• ○	
16	4• •3 •1 ○	•2 ₁
17	•4 1• •3 ○	2•
18	•4 2• ○	1• •3
19	•4 •1 ○	2 3•
20	•4 ○	1• 3• ₂
21	3• 2• ○	•4 •1●
22	3• •2 1• ○	•4
23	•3 ○	•2 ₁ •4
24	1• •3 ○	2• •4
25	2• ○	1• •3 4•
26	•1 ₂ ○	•3 4•
27	○	1• •2 ₃ 4•
28	○2•	3• •1 4•
29	○1•	3• •2 4• ○
30	•3 ₄ ○	•1 ₂

GREENWICH MEAN TIME.

MAY.

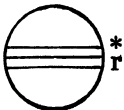
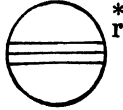
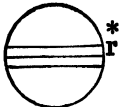
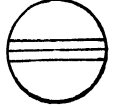
d	h	m		d	h	m		d	h	m		d	h	m		d	h	m	
1	10	18	I. Sh. I.	10	6	34	I. Tr. I.	19	5	15	I. Sh. E.	27	7	34	III. Sh. E.				
	10	24	I. Tr. I.		6	41	I. Sh. I.		23	58	I. Oc. D.		22	56	I. Tr. I.				
	12	28	I. Sh. E.		8	43	I. Tr. E.		23	59	II. Tr. I.		23	28	I. Sh. I.				
	12	33	I. Tr. E.		8	51	I. Sh. E.												
2	4	0.1	III. Ec. D.	11	3	9	II. Oc. D.	20	0	38	III. Tr. I.	28	1	5	I. Tr. E.				
	5	45.2	III. Ec. R.		3	48	I. Oc. D.		0	39	II. Sh. I.		1	38	I. Sh. E.				
	6	14	II. Sh. I.		5	45.1	II. Ec. R.		1	51	III. Sh. I.		20	9	I. Oc. D.				
	6	25	II. Tr. I.		6	5.7	I. Ec. R.		2	14	III. Tr. E.		20	51	II. Oc. D.				
	7	34.3	I. Ec. D.						2	28.1	II. Tr. E.		22	50.7	I. Ec. R.				
	8	34	II. Sh. E.	12	1	1	I. Tr. I.		2	58	I. Ec. R.								
	8	39	II. Tr. E.		1	10	I. Sh. I.		3	35	II. Sh. E.	29	0	18.2	II. Ec. R.				
	9	47	I. Oc. R.		3	9	I. Tr. E.		21	11	III. Sh. E.		17	23	I.*Tr. I.				
					3	20	I. Sh. E.		21	33	I. Tr. I.		17	57	I.*Sh. I.				
3	4	47	I. Sh. I.		21	22	III. Tr. I.		23	20	I. Sh. I.		19	32	I.*Tr. E.				
	4	50	I. Tr. I.		21	45	II. Tr. I.		23	43	I. Tr. E.		20	6	I. Sh. E.				
	6	57	I. Sh. E.		21	52	III. Sh. I.				I. Sh. E.								
	6	59	I. Tr. E.		22	5	II. Sh. I.	21	18	24	I.*Oc. D.	30	14	35	I.*Oc. D.				
					22	14	I. Oc. D.		18	34	II.*Oc. D.		15	22	II.*Tr. I.				
4	0	47.3	II. Ec. D.		22	35	III. Tr. E.		20	56.6	I. Ec. R.		16	30	II.*Sh. I.				
	2	2.7	I. Ec. D.		23	36	III. Sh. E.		21	41.2	II. Ec. R.		17	19.2	I.*Ec. R.				
	3	9	II. Oc. R.										17	38	II.*Tr. E.				
	4	13	I. Oc. R.	13	0	0	II. Tr. E.	22	15	37	I.*Tr. I.		17	38	III.*Oc. D.				
	23	16	I. Sh. I.		0	25	II. Sh. E.		16	2	I.*Sh. I.		18	49	II.*Sh. E.				
	23	16	I. Tr. I.		0	34.2	I. Ec. R.		17	46	I.*Tr. E.		19	4	III.*Oc. R.				
					19	27	I.*Tr. I.		18	12	I.*Sh. E.		19	52.3	III.*Ec. D.				
5	1	25	I. Tr. E.		19	39	I.*Sh. I.						21	37.7	III. Ec. R.				
	1	26	I. Sh. E.		21	35	I. Tr. E.	23	12	50	I.*Oc. D.	31	11	49	I. Tr. I.				
	17	53	III.*Sh. I.		21	49	I. Sh. E.		13	6	II.*Tr. I.		12	25	I. Sh. I.				
	18	7	III.*Tr. I.						13	56	II.*Sh. I.		13	58	I.*Tr. E.				
	19	16	III.*Tr. E.	14	16	17	II.*Oc. D.		14	20	III.*Oc. D.		14	35	I.*Sh. E.				
	19	31	II.*Sh. I.		16	40	I.*Oc. D.		15	22	II.*Tr. E.								
	19	32	II.*Tr. I.		19	2.7	I.*Ec. R.		15	25.1	I.*Ec. R.								
	19	38	III.*Sh. E.		19	4.3	II.*Ec. R.		15	42	III.*Oc. R.								
	20	31	I.*Oc. D.						15	54.2	III.*Ec. D.								
	21	46	II. Tr. E.	15	13	53	I.*Tr. I.		16	15	II.*Sh. E.								
	21	51	II. Sh. E.		14	7	I.*Sh. I.		17	39.6	III.*Ec. R.								
	22	40.4	I. Ec. R.		16	1	I.*Tr. E.	24	10	4	I. Tr. I.								
					16	17	I.*Sh. E.		10	31	I. Sh. I.								
6	17	42	I.*Tr. I.	16	10	52	II. Tr. I.		12	12	I. Tr. E.								
	17	44	I.*Sh. I.		11	4	III. Oc. D.		12	40	I. Sh. E.								
	19	51	I.*Tr. E.		11	6	I. Oc. D.												
	19	54	I.*Sh. E.		11	22	II. Sh. I.												
7	14	2	II.*Oc. D.		13	7	II.*Tr. E.	25	7	17	I. Oc. D.								
	14	57	I.*Oc. D.		13	31.1	I.*Ec. R.		7	42	II. Oc. D.								
	16	27.4	II.*Ec. R.		13	41	II.*Sh. E.		9	53.6	I. Ec. R.								
	17	8.8	I.*Ec. R.		13	41.5	III.*Ec. R.		10	59.2	II. Ec. R.								
8	12	8	I. Tr. I.	17	8	19	I. Tr. I.	26	4	30	I. Tr. I.								
	12	13	I. Sh. I.		8	36	I. Sh. I.		4	59	I. Sh. I.								
	14	17	I.*Tr. E.		10	28	I. Tr. E.		6	39	I. Tr. E.								
	14	23	I.*Sh. E.		10	46	I. Sh. E.		7	9	I. Sh. E.								
9	7	50	III. Oc. D.	18	5	25	II. Oc. D.	27	1	43	I. Oc. D.								
	8	38	II. Tr. I.		5	32	I. Oc. D.		2	14	II. Tr. I.								
	8	48	II. Sh. I.		7	59.6	I. Ec. R.		3	13	II. Sh. I.								
	9	23	I. Oc. D.		8	22.2	II. Ec. R.		3	56	III. Tr. I.								
	9	43.3	III. Ec. R.						4	22.1	I. Ec. R.								
	10	53	II. Tr. E.	19	2	45	I. Tr. I.		4	30	II. Tr. E.								
	11	8	II. Sh. E.		3	5	I. Sh. I.		5	19	III. Tr. E.								
	11	37.3	I. Ec. R.		4	54	I. Tr. E.		5	32	II. Sh. E.								
									5	50	III. Sh. I.								

NOTE.—I. denote; Ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		III.	
II.		IV. No Eclipse.	

Configurations at 17^h 0^m for an Inverting Telescope.

Day.	West.			East.		
1	4.	3.	1. ○	2.		
2	4.	2.	○	3.	1.	
3	4.	2.	○		3.	
4	4.		○	1.	2.	3.
5	4.	1.	3. ○	2.		
6		3.	2. 4. 1. ○			
7		3.	○	4.		1. ●
8		3.	1. ○	2.	4.	
9		2.	○	3.	1.	4.
10		2.	1. ○		3.	4.
11			○	1.	2.	3.
12		1.	○	3.	2.	4.
13		2.	3. ○	1.		4.
14		3.	○	4.		1. ● 2. ●
15		3.	1. ○	2.		
16		4.	2. ○	3.	1.	
17	4.	2.	1. ○		3.	
18	4.		○	1.	2.	3.
19	4.		1. ○	3.	2.	
20	4.	2.	3. ○	1.		
21	4.	3.	○	1.	2.	
22	1.	4.	3. ○	2.		
23		4.	2. ○	1.		3. ●
24		2.	1. ○	4.	3.	
25			○	2.	1.	3.
26		1.	○	3.	2.	4.
27		2.	3. ○	1.		4.
28	3.		1. ○		4.	
29		3.	1. ○	2.		4.
30	2.		○	3.	4.	1. ●
31		2.	1. ○	4.	3.	

GREENWICH MEAN TIME.

JUNE.

d	h	m		d	h	m		d	h	m		d	h	m	
1	9	2	I. Oc. D.	10	6	48	II. Tr. I.	18	5	13	I. Sh. I.	27	2	43	I. Tr. E.
10	0		II. Oc. D.	8	10.6		I. Ec. R.	6	26		I. Tr. E.		3	46	I. Sh. E.
11	47.7		I. Ec. R.	8	21		II. Sh. I.	7	22		I. Sh. E.	21	44		I. Oc. D.
13	36.4		II.*Ec. R.	9	6		II. Tr. E.								
				10	40		III. Tr. I.	19	1	28	I. Oc. D.	28	0	42	II. Tr. I.
2	6	16	I. Tr. I.	10	40		II. Sh. E.	3	53		II. Oc. D.		0	56.7	I. Ec. R.
6	54		I. Sh. I.	12	12		III. Tr. E.	4	33.6		I. Ec. R.		2	48	II. Sh. I.
8	25		I. Tr. E.	13	47		III.*Sh. I.	8	9.8		II. Ec. R.		3	1	II. Tr. E.
9	4		I. Sh. E.	15	32		III.*Sh. E.	22	44		I. Tr. I.		5	6	II. Sh. E.
								23	41		I. Sh. I.		7	28	III. Oc. D.
3	3	28	I. Oc. D.	11	2	29	I. Tr. I.						9	12	III. Oc. R.
4	30		II. Tr. I.	3	18		I. Sh. I.	20	0	53	I. Tr. E.	11	47.6		III. Ec. D.
5	47		II. Sh. I.	4	38		I. Tr. E.	1	51		I. Sh. E.	13	33.9		III.*Ec. R.
6	16.3		I. Ec. R.	5	27		I. Sh. E.	19	55		I. Oc. D.	19	1		I. Tr. I.
6	47		II. Tr. E.	23	41		I. Oc. D.	22	19		II. Tr. I.	20	5		I. Sh. I.
7	16		III. Tr. I.					23	2.2		I. Ec. R.	21	10		I. Tr. E.
8	6		II. Sh. E.	12	1	31	II. Oc. D.					22	14		I. Sh. E.
8	43		III. Tr. E.	2	39.1		I. Ec. R.	21	0	13	II. Sh. I.				
9	49		III. Sh. I.	5	32.6		II. Ec. R.	0	37		II. Tr. E.	29	16	11	I.*Oc. D.
11	33		III. Sh. E.	20	56		I. Tr. I.	2	32		II. Sh. E.		19	25.3	I. Ec. R.
				21	46		I. Sh. I.	3	54		III. Oc. D.		19	31	II. Oc. D.
4	0	42	I. Tr. I.	23	5		I. Tr. E.	5	34		III. Oc. R.				
1	23		I. Sh. I.	23	56		I. Sh. E.	7	48.8		III. Ec. D.	30	0	5.2	II. Ec. R.
2	51		I. Tr. E.					9	34.8		III. Ec. R.		13	29	I.*Tr. I.
3	32		I. Sh. E.	13	18	8	I.*Oc. D.	17	12		I.*Tr. I.		14	34	I.*Sh. I.
21	54		I. Oc. D.	19	58		II. Tr. I.	18	10		I.*Sh. I.		15	38	I.*Tr. E.
23	10		II. Oc. D.	21	7.7		I. Ec. R.	19	21		I. Tr. E.		16	43	I.*Sh. E.
				21	39		II. Sh. I.	20	19		I. Sh. E.				
5	0	44.8	I. Ec. R.	22	16		II. Tr. E.								
2	55.4		II. Ec. R.	23	57		II. Sh. E.	22	14	22	I.*Oc. D.				
19	9		I.*Tr. I.					17	5		II.*Oc. D.				
19	52		I. Sh. I.	14	0	25	III. Oc. D.	17	30.8		I.*Ec. R.				
21	18		I. Tr. E.	2	0		III. Oc. R.	21	28.0		II. Ec. R.				
22	1		I. Sh. E.	3	49.6		III. Ec. D.								
				5	35.3		III. Ec. R.	23	11	39	I. Tr. I.				
6	16	21	I.*Oc. D.	15	23		I.*Tr. I.	12	39		I. Sh. I.				
17	39		II.*Tr. I.	16	15		I.*Sh. I.	13	48		I.*Tr. E.				
19	4		II.*Sh. I.	17	32		I.*Tr. E.	14	48		I.*Sh. E.				
19	13.4		I.*Ec. R.	18	25		I.*Sh. E.								
19	56		II. Tr. E.					24	8	49	I. Oc. D.				
21	0		III. Oc. D.	15	12	34	I. Oc. D.	11	30		II. Tr. I.				
21	23		II. Sh. E.	14	41		II.*Oc. D.	11	59.4		I. Ec. R.				
22	31		III. Oc. R.	15	36.3		I.*Ec. R.	13	31		II.*Sh. I.				
23	51.0		III. Ec. D.	18	50.7		II.*Ec. R.	13	49		II.*Tr. E.				
								15	49		II.*Sh. E.				
7	1	36.5	III. Ec. R.	16	9	50	I. Tr. I.	17	38		III.*Tr. I.				
13	36		I.*Tr. I.	10	44		I. Sh. I.	19	19		III. Tr. E.				
14	20		I.*Sh. I.	11	59		I. Tr. E.	21	45		III. Sh. I.				
15	45		I.*Tr. E.	12	53		I. Sh. E.	23	29		III. Sh. E.				
16	30		I.*Sh. E.												
				17	7	1	I. Oc. D.	25	6	6	I. Tr. I.				
8	10	48	I. Oc. D.	9	8		II. Tr. I.	7	8		I. Sh. I.				
12	19		II. Oc. D.	10	4.9		I. Ec. R.	8	15		I. Tr. E.				
13	42.0		I.*Ec. R.	10	56		II. Sh. I.	9	17		I. Sh. E.				
16	13.5		II.*Ec. R.	11	26		II. Tr. E.								
				13	14		II.*Sh. E.	26	3	17	I. Oc. D.				
9	8	3	I. Tr. I.	14	7		III.*Tr. I.	6	18		II. Oc. D.				
8	49		I. Sh. I.	15	43		III.*Tr. E.	6	28.1		I. Ec. R.				
10	11		I. Tr. E.	17	46		III.*Sh. I.	10	47.0		II. Ec. R.				
10	59		I. Sh. E.	19	30		III. Sh. E.								
								27	0	34	I. Tr. I.				
10	5	14	I. Oc. D.	18	4	17	I. Tr. I.	1	37		I. Sh. I.				

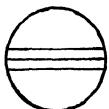
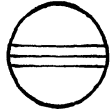
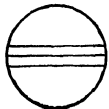
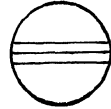
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* r	IV. No Eclipse.		

Configurations at 16^h 0^m for an Inverting Telescope.

Day.	West.				East.			
1				4•	○ ⁻² ₁		3•	
2			4•	1•	○		2• ₃	
3			4•	2•	3•	○	1•	
4			4•	3•	○ ⁻² ₁			
5			4•	3•		○	1•	2•
6			4•			○ ⁻³ ₁ ₂		
7			4•	2•	1•	○		3•
8				4•		○	1•	3•
9					1•	○	4•	2• ₃
10					2•	3•	○	1•
11				3•	○ ⁻² ₁			4•
12				3•		○	1•	2•
13					3•	1•	○	2•
14	○	1•		2•		○	3•	4•
15						○	1•	3•
16					1•	○		2•
17					2•	○	4•	1•
18				3•	○ ⁻² ₄			
19				4•	○ ⁻³ ₄		1•	2•
20			4•		3•	1•	○	2•
21			4•		2•	1•	○	3•
22			4•			○	2•	3•
23			4•			1•	○	2•
24				4•		2•	3•	○
25				3•	○ ⁻⁴ ₁			
26				3•		○	4•	1•
27					3•	1•	○	2•
28					2•		○	1•
29						2•	1•	○
30						1•	○	2•

GREENWICH MEAN TIME.

JULY.

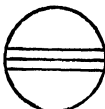
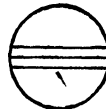
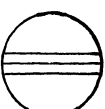
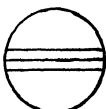
d	h	m		d	h	m		d	h	m		d	h	m	
1	10	39	I. Oc. D.	9	2	44	III. Tr. E.	16	15	2	I.*Sh. E.	24	18	55.4	II. Ec. D.
13	54.0		I.*Ec. R.	5	43		III. Sh. I.					21	15.4		II. Ec. R.
13	54		II.*Tr. I.	7	29		III. Sh. E.	17	8	49	I. Oc. D.				
16	5		II.*Sh. I.	9	47		I. Tr. I.	12	12.1		I. Ec. R.	25	8	2	I. Tr. I.
16	14		II.*Tr. E.	10	58		I. Sh. I.	13	45		II.*Oc. D.		9	17	I. Sh. I.
18	23		II. Sh. E.	11	57		I. Tr. E.	16	9		II.*Oc. R.	10	11		I. Tr. E.
21	15		III. Tr. I.	13	7		I.*Sh. E.	16	18.3		II.*Ec. D.	11	26		I. Sh. E.
23	0		III. Tr. E.					18	38.4		II. Ec. R.				
2	1	44	III. Sh. I.	10	6	57	I. Oc. D.					26	5	10	I. Oc. D.
3	29		III. Sh. E.	10	17.3		I. Ec. R.	18	6	8	I. Tr. I.	8	35.5		I. Ec. R.
7	56		I. Tr. I.	11	14		II. Oc. D.		7	22	I. Sh. I.	10	36		II. Tr. I.
9	3		I. Sh. I.	13	37		II.*Oc. R.		8	17	I. Tr. E.	12	58		II.*Tr. E.
10	5		I. Tr. E.	13	41.1		II.*Ec. D.		9	31	I. Sh. E.	13	8		II.*Sh. I.
11	12		I. Sh. E.	16	1.4		II.*Ec. R.					15	26		II.*Sh. E.
3	5	6	I. Oc. D.	11	4	15	I. Tr. I.	19	3	17	I. Oc. D.		22	28	III. Oc. D.
8	22.6		I. Ec. R.	5	27		I. Sh. I.		6	40.7	I. Ec. R.	27	0	25	III. Oc. R.
8	45		II. Oc. D.	6	25		I. Tr. E.		8	4	II. Tr. I.		2	30	I. Tr. I.
13	24.2		II.*Ec. R.	7	36		I. Sh. E.		10	25	II. Tr. E.		3	42.8	III. Ec. D.
4	2	24	I. Tr. I.						12	51	II. Sh. E.		3	46	I. Sh. I.
3	32		I. Sh. I.	12	1	25	I. Oc. D.		18	36	III. Oc. D.		4	39	I. Tr. E.
4	33		I. Tr. E.	4	46.0		I. Ec. R.		20	30	III. Oc. R.		5	30.3	III. Ec. R.
5	41		I. Sh. E.	5	34		II. Tr. I.		23	43.6	III. Ec. D.		5	55	I. Sh. E.
23	34		I. Oc. D.	7	55		II. Tr. E.						23	38	I. Oc. D.
5	2	51.3	I. Ec. R.	10	16		II. Sh. E.	20	0	36	I. Tr. I.	28	3	4.3	I. Ec. R.
3	7		II. Tr. I.	14	49		III.*Oc. D.		1	30.8	III. Ec. R.		5	36	II. Oc. D.
5	23		II. Sh. I.	16	40		III.*Oc. R.		1	51	I. Sh. I.		8	0	II. Oc. R.
5	27		II. Tr. E.	19	45.0		III. Ec. D.		2	46	I. Tr. E.		8	13.6	II. Ec. D.
7	41		II. Sh. E.	21	31.8		III. Ec. R.		4	0	I. Sh. E.		10	33.6	II. Ec. R.
11	6		III. Oc. D.	22	43		I. Tr. I.	21	45		I. Oc. D.		20	59	I. Tr. I.
12	54		III. Oc. R.	23	56		I. Sh. I.	21	1	9.5	I. Ec. R.		22	15	I. Sh. I.
15	46.4		III.*Ec. D.						3	2	II. Oc. D.		23	8	I. Tr. E.
17	33.0		III. Ec. R.	13	0	53	I. Tr. E.		5	25	II. Oc. R.	29	0	24	I. Sh. E.
20	52		I. Tr. I.	2	4		I. Sh. E.		5	36.5	II. Ec. D.		18	7	I. Oc. D.
22	0		I. Sh. I.	19	53		I. Oc. D.		7	56.6	II. Ec. R.		21	33.0	I. Ec. R.
23	1		I. Tr. E.	23	14.7		I. Ec. R.		19	5	I. Tr. I.		23	53	II. Tr. I.
6	0	9	I. Sh. E.	14	0	29	II. Oc. D.		20	20	I. Sh. I.	30	2	15	II. Tr. E.
18	1		I. Oc. D.	2	52		II. Oc. R.		21	14	I. Tr. E.		2	26	II. Sh. I.
21	20.0		I. Ec. R.	2	59.4		II. Ec. D.		22	28	I. Sh. E.		4	44	II. Sh. E.
21	59		II. Oc. D.	5	19.6		II. Ec. R.	22	16	13	I.*Oc. D.		12	27	III. Tr. I.
7	0	21	II. Oc. R.	17	12		I. Tr. I.		19	38.1	I. Ec. R.		14	23	III.*Tr. E.
0	22.1		II. Ec. D.	18	24		I. Sh. I.		21	20	II. Tr. I.		15	27	I.*Tr. I.
2	42.4		II. Ec. R.	19	21		I. Tr. E.		23	41	II. Tr. E.		16	44	I. Sh. I.
15	20		I.*Tr. I.	20	33		I. Sh. E.		23	51	II. Sh. I.		17	37	I. Tr. E.
16	29		I.*Sh. I.										17	41	III. Sh. I.
17	29		I. Tr. E.	15	14	21	I.*Oc. D.	23	2	8	II. Sh. E.		18	52	I. Sh. E.
18	38		I. Sh. E.	17	43.4		I. Ec. R.		8	33	III. Tr. I.		19	27	III. Sh. E.
8	12	29	I. Oc. D.	18	49		II. Tr. I.		10	26	III. Tr. E.				
15	48.6		I.*Ec. R.	21	10		II. Tr. E.		13	33	I.*Tr. I.				
16	20		II.*Tr. I.	21	15		II. Sh. I.		13	42	III.*Sh. I.	31	12	35	I. Oc. D.
18	40		II. Sh. I.	23	33		II. Sh. E.		14	48	I.*Sh. I.		16	1.7	I. Ec. R.
18	41		II. Tr. E.						15	28	III.*Sh. E.		18	55	II. Oc. D.
20	58		III. Sh. E.	16	4	43	III. Tr. I.		15	42	I.*Tr. E.		21	19	II. Oc. R.
9	0	56	III. Tr. I.	11	40		III. Tr. E.		16	57	I. Sh. E.		21	32.3	II. Ec. D.
				12	53		III. Sh. I.	24	10	41			23	52.3	II. Ec. R.
				13	49		I. Tr. I.		14	6.8	I. Oc. D.				
							I. Sh. I.		16	19	I.*Ec. R.				
							I.*Tr. E.		18	43	II. Oc. D.				
											II. Oc. R.				

NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow. *Visible at Washington.

GREENWICH MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* r	IV. No Eclipse.		

Configurations at 15^h 0^m for an Inverting Telescope.

Day.	West.			East.		
1	○ 2.			○ .1 3.	4.	
2		.2 3.	1.	○	4.	
3		3.		○ .2 .1	4.	
4		.3 .1	4	○ .	2.	
5		.2 4.		○ .3 1.		
6		4.	.2 .1	○	.3	
7		4.	1	○ .	.2 3.	
8		4.	2	○ . 3.		.1 ●
9		.4	.2 3.	1.	○	
10		.4 3.		○ .1		.2 ●
11		.4 .3 1.		○ 2.		
12		.2 4.		○ 1.		.3 ●
13		.2 .1		○ .4 .3		
14				○ 1. .2 .4 3.		
15				○ 2. 3.	.4	.1 ●
16		2. 3. 1.		○	.4	
17		3.		○ .1	4.	.2 ●
18		.3 1.		○ 2.	4.	
19			2. .3	○ .1	4.	
20		.2 .1		○ 4. .3		
21			4.	○ 1. .2 3.		
22		4.	. .	○ 1 2. 3.		
23	○ 1.	4.	2. 3.	○		
24		4.	3.	. ○ 2 .1		
25		4.	.3 1.	○ 2.		
26		.4	.3 2.	○ .1		
27		.4	.2 .1	○ .3		
28		.4		○ 1. .2 .3		
29			.1 4.	○ 2. 3.		
30		2.	1 3.	○ .4		
31		3.	.2	○	.4	.1 ●

GREENWICH MEAN TIME.

AUGUST.

d h m		d h m		d h m		d h m	
1 9 56	I. Tr. I.	9 18 8	II. Tr. E.	17 11 40	I. Sh. E.	25 18 37	II. Oc. R.
11 12	I. Sh. I.	18 19	II. Sh. I.	12 33	III.*Oc. R.	18 40.3	II. Ec. D.
12 5	I. Tr. E.	20 37	II. Sh. E.	15 40.4	III. Ec. D.	20 59.9	II. Ec. R.
13 21	I.*Sh. E.			17 29.3	III. Ec. R.		
2 7 4	I. Oc. D.	10 6 21	I. Tr. I.	18 5 24	I. Oc. D.	26 4 44	I. Tr. I.
10 30.4	I. Ec. R.	6 26	III. Oc. D.	8 49.0	I. Ec. R.	5 55	I. Sh. I.
13 10	II.*Tr. I.	7 36	I. Sh. I.	13 31	II.*Oc. D.	6 53	I. Tr. E.
15 32	II.*Tr. E.	8 27	III. Oc. R.	15 56	II. Ec. R.	8 4	I. Sh. E.
15 44	II.*Sh. I.	8 30	I. Tr. E.	16 3.9	II. Ec. D.	27 1 51	I. Oc. D.
18 1	II. Sh. E.	9 45	I. Sh. E.	18 23.6	II. Ec. R.	5 12.6	I. Ec. R.
		11 41.4	III. Ec. D.			10 24	II. Tr. I.
		13 29.7	III.*Ec. R.			12 47	II.*Tr. E.
3 2 25	III. Oc. D.	11 3 28	I. Oc. D.	19 2 46	I. Tr. I.	12 49	II.*Sh. I.
4 24	III. Oc. R.	6 54.0	I. Ec. R.	4 0	I. Sh. I.	15 7	II. Sh. E.
4 25	I. Tr. I.	10 51	II. Oc. D.	4 56	I. Tr. E.	23 13	I. Tr. I.
5 41	I. Sh. I.	13 16	II.*Oc. R.	6 9	I. Sh. E.		
6 34	I. Tr. E.	13 27.3	II.*Ec. D.	23 54	I. Oc. D.		
7 41.8	III. Ec. D.	15 47.0	II. Ec. R.	20 3 17.7	I. Ec. R.	28 0 24	I. Sh. I.
7 50	I. Sh. E.			7 44	II. Tr. I.	1 23	I. Tr. E.
9 29.7	III. Ec. R.	12 0 50	I. Tr. I.	10 7	II. Tr. E.	2 33	I. Sh. E.
4 1 33	I. Oc. D.	2 5	I. Sh. I.	10 13	II. Sh. I.	4 43	III. Tr. I.
4 59.1	I. Ec. R.	2 59	I. Tr. E.	12 31	II.*Sh. E.	6 46	III. Tr. E.
8 13	II. Oc. D.	4 14	I. Sh. E.	21 15	I. Tr. I.	9 37	III. Sh. I.
10 37	II. Oc. R.	21 57	I. Oc. D.	22 29	I. Sh. I.	11 25	III. Sh. E.
10 50.5	II. Ec. D.			23 25	I. Tr. E.	20 20	I. Oc. D.
13 10.4	II.*Ec. R.	13 1 22.7	I. Ec. R.	21 0 33	III. Tr. I.	23 41.4	I. Ec. R.
22 54	I. Tr. I.	5 5	II. Tr. I.	0 38	I. Sh. E.	29 5 34	II. Oc. D.
5 0 10	I. Sh. I.	7 27	II. Tr. E.	0 38	III. Tr. E.	7 58	II. Oc. R.
1 3	I. Tr. E.	7 37	II. Sh. I.	2 35	III. Tr. E.	7 58.6	II. Ec. D.
2 19	I. Sh. E.	9 55	II. Sh. E.	5 38	III. Sh. I.	10 18.2	II. Ec. R.
20 2	I. Oc. D.	19 19	I. Tr. I.	7 25	III. Sh. E.	17 43	I. Tr. I.
23 27.8	I. Ec. R.	20 27	III. Tr. I.	18 23	I. Oc. D.	18 53	I. Sh. I.
		20 34	I. Sh. I.	21 46.5	I. Ec. R.	19 52	I. Tr. E.
6 2 28	II. Tr. I.	21 28	I. Tr. E.			21 1	I. Sh. E.
4 50	II. Tr. E.	22 27	III. Tr. E.	22 2 52	II. Oc. D.		
5 1	II. Sh. I.	22 42	I. Sh. E.	5 16	II. Oc. R.	30 14 50	I. Oc. D.
7 19	II. Sh. E.			5 22.3	II. Ec. D.	18 10.1	I. Ec. R.
16 25	III. Tr. I.	14 1 38	III. Sh. I.	7 41.9	II. Ec. R.	23 45	II. Tr. I.
17 22	I. Tr. I.	3 25	III. Sh. E.	15 45	I. Tr. I.		
18 23	III. Tr. E.	16 26	I. Oc. D.	16 58	I. Sh. I.	31 2 7	II. Sh. I.
18 39	I. Sh. I.	19 51.5	I. Ec. R.	17 55	I. Tr. E.	2 8	II. Tr. E.
19 32	I. Tr. E.			19 6	I. Sh. E.	4 25	II. Sh. E.
20 47	I. Sh. E.	15 0 11	II. Oc. D.			12 12	I.*Tr. I.
21 39	III. Sh. I.	2 36	II. Oc. R.	23 12 52	I.*Oc. D.	13 21	I.*Sh. I.
23 26	III. Sh. E.	2 45.8	II. Ec. D.	16 15.1	I. Ec. R.	14 22	I. Tr. E.
		5 5.5	II. Ec. R.	21 4	II. Tr. I.	15 30	I. Sh. E.
7 14 30	I.*Oc. D.	13 48	I.*Tr. I.	23 27	II. Tr. E.	18 49	III. Oc. D.
17 56.6	I. Ec. R.	15 3	I. Sh. I.	23 31	II. Sh. I.	20 54	III. Oc. R.
21 32	II. Oc. D.	15 57	I. Tr. E.			23 38.0	III. Ec. D.
23 56	II. Oc. R.	17 11	I. Sh. E.	24 1 49	II. Sh. E.		
8 0 9.2	II. Ec. D.	16 10 55	I. Oc. D.	10 14	I. Tr. I.		
2 29.0	II. Ec. R.	14 20.2	I.*Ec. R.	11 26	I. Sh. I.		
11 51	I. Tr. I.	18 24	II. Tr. I.	12 24	I.*Tr. E.		
13 8	I.*Sh. I.	20 47	II. Tr. E.	13 35	I.*Sh. E.		
14 1	I.*Tr. E.	20 55	II. Sh. I.	14 38	III. Oc. D.		
15 16	I.*Sh. E.	23 13	II. Sh. E.	16 42	III. Oc. R.		
				19 39.3	III. Ec. D.		
9 8 59	I. Oc. D.	17 8 17	I. Tr. I.	21 28.7	III. Ec. R.		
12 25.3	I. Ec. R.	9 31	I. Sh. I.				
15 46	II. Tr. I.	10 27	I. Tr. E.	25 7 22	I. Oc. D.		
		10 30	III. Oc. D.	10 43.9	I. Ec. R.		
				16 12	II. Oc. D.		

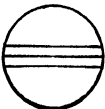
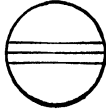
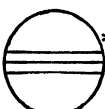
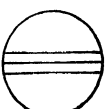
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d * r
II.		* d *	IV. No Eclipse.		

Configurations at 13^h 45^m for an Inverting Telescope.

Day.	West.			East.		
1		•3	1• ○	•2	•4	
2	○ 2•		•3 ○	•1	•4	
3		•2 1•	○	•3	4•	
4			○	•2 1•	•3 4•	
5		•1	○	2• 3• 4•		
6		2• 3•	○	•1 4•		
7		3•	•24• ○	1		
8	○ 1•	•3 4•	○	•2		
9		4•	○	•2 •1		
10	4•	•3	○	•3		
11	•4	2• 1•	○	•1 •3		•2 ●
12	•4	•1	○	2• 3•		
13	•4	2•	○	•1 3•		
14		•3 •2 •1	○			
15		3•	○	•4 •2		
16		•3	○	2• •4		•1 ●
17		2• 1•	○	•3 •4		
18			○	•1 •3 •4		•2 ●
19		1•	○	2• 3• •4		
20		2•	○	•1 3• 4•		
21		•2 3•	○	•1 4•		
22		3•	○	•1 •2 4•		
23		•3	○	•2 4•		•1 ●
24		2• 4•	○	•1 •3		
25		4•	○	•2 •1 •3		
26		4•	○	•2 3•		
27	4•		○	2• 1• 3•		
28	•4	•2 •1 3•	○			
29	•4 3•		○	•1 •2		
30	•4 •3	•1 2•	○			
31	○ 1•	•2 •3	○			

GREENWICH MEAN TIME.

SEPTEMBER.

d h m		d h m		d h m		d h m	
1 1 27.9	III. Ec. R.	10 5 48	I. Oc. D.	18 8 17	I. Sh. E.	27 1 39	I. Tr. I.
9 19	I. Oc. D.	9 2.5	I. Ec. R.	17 28	III. Tr. I.	2 32	I. Sh. I.
12 38.9	I.*Ec. R.	15 50	II. Tr. I.	19 34	III. Tr. E.	3 49	I. Tr. E.
18 55	II. Oc. D.	18 1	II. Sh. I.	21 33	III. Sh. I.	4 41	I. Sh. E.
23 36.1	II. Ec. R.	18 14	II. Tr. E.	23 23	III. Sh. E.	22 47	I. Oc. D.
		20 19	II. Sh. E.				
2 6 42	I. Tr. I.			19 2 17	I. Oc. D.	28 1 49.8	I. Ec. R.
7 50	I. Sh. I.	11 3 10	I. Tr. I.	5 26.2	I. Ec. R.	10 46	II. Tr. I.
8 52	I. Tr. E.	4 14	I. Sh. I.	13 47	II. Oc. D.	12 31	II. Sh. I.
9 59	I. Sh. E.	5 20	I. Tr. E.	18 5.6	II. Ec. R.	13 8	II. Tr. E.
		6 23	I. Sh. E.	23 39	I. Tr. I.	14 50	II. Sh. E.
3 3 49	I. Oc. D.	13 11	III.*Tr. I.			20 9	I. Tr. I.
7 7.5	I. Ec. R.	15 16	III. Tr. E.	20 0 37	I. Sh. I.	21 1	I. Sh. I.
13 7	II.*Tr. I.	17 35	III. Sh. I.	1 49	I. Tr. E.	22 19	I. Tr. E.
15 25	II. Sh. I.	19 24	III. Sh. E.	2 46	I. Sh. E.	23 10	I. Sh. E.
15 30	II. Tr. E.			20 47	I. Oc. D.		
17 43	II. Sh. E.	12 0 17	I. Oc. D.	23 54.9	I. Ec. R.	29 11 59	III.*Oc. D.
		3 31.3	I. Ec. R.			14 7	III. Oc. R.
4 1 11	I. Tr. I.	11 1	II. Oc. D.	21 7 58	II. Tr. I.	15 34.2	III. Ec. D.
2 19	I. Sh. I.	15 30.0	II. Ec. R.	9 55	II. Sh. I.	17 17	I. Oc. D.
3 21	I. Tr. E.	21 40	I. Tr. I.	10 22	II. Tr. E.	17 26.3	III. Ec. R.
4 28	I. Sh. E.	22 42	I. Sh. I.	12 14	II.*Sh. E.	20 18.5	I. Ec. R.
8 56	III. Tr. I.	23 50	I. Tr. E.	18 9	I. Tr. I.		
11 0	III. Tr. E.			19 6	I. Sh. I.	30 5 56	II. Oc. D.
13 36	III.*Sh. I.	13 0 51	I. Sh. E.	20 19	I. Tr. E.	9 58.6	II. Ec. R.
15 25	III. Sh. E.	18 47	I. Oc. D.	21 15	I. Sh. E.	14 39	I. Tr. I.
22 19	I. Oc. D.	21 59.9	I. Ec. R.			15 29	I. Sh. I.
5 1 36.3	I. Ec. R.	14 5 12	II. Tr. I.	22 7 38	III. Oc. D.	16 49	I. Tr. E.
8 17	II. Oc. D.	7 19	II. Sh. I.	9 45	III. Oc. R.	17 38	I. Sh. E.
12 54.2	II.*Ec. R.	7 36	II. Tr. E.	11 34.7	III. Ec. D.		
19 41	I. Tr. I.	9 37	II. Sh. E.	13 26.3	III. Ec. R.		
20 48	I. Sh. I.	16 10	I. Tr. I.	15 17	I. Oc. D.		
21 51	I. Tr. E.	17 11	I. Sh. I.	18 23.6	I. Ec. R.		
22 56	I. Sh. E.	18 20	I. Tr. E.	23 3 10	II. Oc. D.		
		19 20	I. Sh. E.	7 23.3	II. Ec. R.		
6 16 48	I. Oc. D.			12 39	I.*Tr. I.		
20 5.0	I. Ec. R.	15 3 19	III. Oc. D.	13 35	I. Sh. I.		
		5 25	III. Oc. R.	14 49	I. Tr. E.		
7 2 28	II. Tr. I.	7 35.8	III. Ec. D.	15 44	I. Sh. E.		
4 43	II. Sh. I.	9 26.8	III. Ec. R.				
4 51	II. Tr. E.	13 17	I. Oc. D.	24 9 47	I. Oc. D.		
7 1	II. Sh. E.	16 28.7	I. Ec. R.	12 52.3	I. Ec. R.		
14 11	I. Tr. I.			21 22	II. Tr. I.		
15 16	I. Sh. I.	16 0 24	II. Oc. D.	23 13	II. Sh. I.		
16 21	I. Tr. E.	4 47.8	II. Ec. R.	23 45	II. Tr. E.		
17 25	I. Sh. E.	10 40	I. Tr. I.				
23 2	III. Oc. D.	11 40	I. Sh. I.	25 1 32	II. Sh. E.		
		12 50	I.*Tr. E.	7 9	I. Tr. I.		
8 1 8	III. Oc. R.	13 49	I. Sh. E.	8 3	I. Sh. I.		
3 36.6	III. Ec. D.			9 19	I. Tr. E.		
5 27.1	III. Ec. R.	17 7 47	I. Oc. D.	10 12	I. Sh. E.		
11 18	I. Oc. D.	10 57.4	I. Ec. R.	21 47	III. Tr. I.		
14 33.8	I. Ec. R.	18 35	II. Tr. I.	23 54	III. Tr. E.		
21 39	II. Oc. D.	20 37	II. Sh. I.				
		20 59	II. Tr. E.	26 1 32	III. Sh. I.		
9 2 12.0	II. Ec. R.	22 56	II. Sh. E.	3 23	III. Sh. E.		
8 40	I. Tr. I.			4 17	I. Oc. D.		
9 45	I. Sh. I.	18 5 9	I. Tr. I.	7 21.1	I. Ec. R.		
10 50	I. Tr. E.	6 9	I. Sh. I.	16 33	II. Oc. D.		
11 54	I. Sh. E.	7 19	I. Tr. E.	20 41.0	II. Ec. R.		

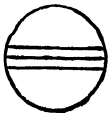
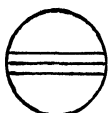
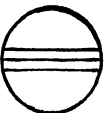
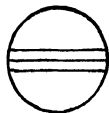
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I.		* r	III.		* d	* r
II.		* r	IV. No Eclipse.			

Configurations at 12^h 30^m for an Inverting Telescope.

Day.	West.				East.			
1			.2	○ ^{.4}	.3			.1 ●
2			1.	○	.2 ^{.4}	.3		
3			2	○.	.1	3.	.4	
4		.2	1.	3.	○		.4	
5		3.		○	1.		.4	.2 ●
6		.3	.1	○	2.		4.	
7			.3 ^{2.}	1	○.		4.	
8			.2	○	.3	4.		.1 ●
9			1.	○	4.	.2	.3	
10			4.	○	.2 ^{.1}	3.		
11		4.	2.	1.	3	○.		
12		4.	3.		○	1.		.2 ●
13		4.	.3	.1	○	2.		
14		.4		.3	2.	○	1.	
15		.4	.2	.○	1	.3		
16	○1.		.4		○	.2	.3	
17			.4	○	.1 ^{2.}	3.		
18			2.	1.	○	.4 ^{3.}		
19			3.	.○	2	.1	.4	
20		3.	.1	○	2.		.4	
21			.3	2.	○	1.		.4
22			.2	.1	○		4.	.3 ●
23				○	.2	.3	4.	
24				○ _{1.}	2.	3.	4.	.1 ●
25			2.	1.	○	3.	4.	
26			3.	.2	4.	○.	.1	
27		3.	4.	1.	○	.2		
28	○2.		4.	.3		○	1.	
29		4.	.2	.1	○			.3 ●
30		4.			○	1.	.2	.3

GREENWICH MEAN TIME.

OCTOBER.

d h m		d h m		d h m		d h m	
1 11 47	I.*Oc. D.	8 16 42.0	I. Ec. R.	16 5 46	II. Tr. I.	23 9 39	II. Sh. I.
14 47.2	I. Ec. R.			7 3	II. Sh. I.	11 0	II. Tr. E.
2 0 9	II. Tr. I.	9 2 57	II. Tr. I.	8 10	II. Tr. E.	11 59	II. Sh. E.
1 50	II. Sh. I.	4 26	II. Sh. I.	9 22	II. Sh. E.	15 11	I. Tr. I.
2 32	II. Tr. E.	5 21	II. Tr. E.	13 10	I. Tr. I.	15 41	I. Sh. I.
4 9	II. Sh. E.	6 45	II. Sh. E.	13 47	I. Sh. I.	17 21	I. Tr. E.
9 9	I. Tr. I.	11 10	I.*Tr. I.	15 21	I. Tr. E.	17 50	I. Sh. E.
9 58	I. Sh. I.	11 52	I. Sh. I.	15 56	I. Sh. E.		
11 19	I. Tr. E.	13 20	I. Tr. E.			24 12 20	I. Oc. D.
12 7	I.*Sh. E.	14 2	I. Sh. E.	17 10 19	I. Oc. D.	15 0.3	I. Ec. R.
				10 57	III. Tr. I.	15 23	III. Tr. I.
3 2 9	III. Tr. I.	10 6 32	III. Tr. I.	13 5	III. Tr. E.	17 27	III. Sh. I.
4 15	III. Tr. E.	8 18	I. Oc. D.	13 5.6	I. Ec. R.	17 31	III. Tr. E.
5 30	III. Sh. I.	8 39	III. Tr. E.	13 28	III. Sh. I.	19 21	III. Sh. E.
6 17	I. Oc. D.	9 29	III. Sh. I.	15 21	III. Sh. E.		
7 22	III. Sh. E.	11 10.8	I.*Ec. R.			25 3 43	II. Oc. D.
9 16.0	I. Ec. R.	11 22	III.*Sh. E.	18 0 55	II. Oc. D.	7 0.6	II. Ec. R.
19 20	II. Oc. D.	22 7	II. Oc. D.	4 26.0	II. Ec. R.	9 41	I. Tr. I.
23 16.2	II. Ec. R.			7 40	I. Tr. I.	10 10	I. Sh. I.
4 3 39	I. Tr. I.	11 1 51.2	II. Ec. R.	8 15	I. Sh. I.	11 52	I. Tr. E.
4 26	I. Sh. I.	5 40	I. Tr. I.	9 51	I. Tr. E.	12 19	I. Sh. E.
5 49	I. Tr. E.	6 21	I. Sh. I.	10 25	I. Sh. E.		
6 36	I. Sh. E.	7 50	I. Tr. E.			26 6 51	I. Oc. D.
		8 30	I. Sh. E.	19 4 49	I. Oc. D.	9 29.0	I. Ec. R.
5 0 47	I. Oc. D.			7 34.2	I. Ec. R.	22 1	II. Tr. I.
3 44.7	I. Ec. R.	12 2 48	I. Oc. D.	19 11	II. Tr. I.	22 57	II. Sh. I.
13 33	II. Tr. I.	5 39.5	I. Ec. R.	20 21	II. Sh. I.		
15 8	II. Sh. I.	16 21	II. Tr. I.	21 35	II. Tr. E.	27 0 25	II. Tr. E.
15 56	II. Tr. E.	17 44	II. Sh. I.	22 40	II. Sh. E.	1 17	II. Sh. E.
17 27	II. Sh. E.	18 45	II. Tr. E.			4 12	I. Tr. I.
22 9	I. Tr. I.	20 3	II. Sh. E.	20 2 11	I. Tr. I.	4 38	I. Sh. I.
22 55	I. Sh. I.			2 44	I. Sh. I.	6 22	I. Tr. E.
6 0 20	I. Tr. E.	13 0 10	I. Tr. I.	4 21	I. Tr. E.	6 48	I. Sh. E.
1 4	I. Sh. E.	0 50	I. Sh. I.	4 53	I. Sh. E.		
16 22	III. Oc. D.	2 20	I. Tr. E.	23 20	I. Oc. D.	28 1 21	I. Oc. D.
18 30	III. Oc. R.	2 59	I. Sh. E.			3 57.7	I. Ec. R.
19 18	I. Oc. D.	20 47	III. Oc. D.	21 1 12	III. Oc. D.	5 36	III. Oc. D.
19 33.0	III. Ec. D.	21 19	I. Oc. D.	2 3.0	I. Ec. R.	9 23.3	III. Ec. R.
21 25.8	III. Ec. R.	22 55	III. Oc. R.	3 21	III. Oc. R.	17 8	II. Oc. D.
22 13.4	I. Ec. R.	23 31.5	III. Ec. D.	3 29.9	III. Ec. R.	20 17.9	II. Ec. R.
7 8 44	II. Oc. D.			5 24.3	III. Ec. R.	22 42	I. Tr. I.
12 33.8	II. Ec. R.	14 0 8.2	I. Ec. R.	14 19	II. Oc. D.	23 7	I. Sh. I.
16 39	I. Tr. I.	1 25.2	III. Ec. R.	17 43.3	II. Ec. R.		
17 24	I. Sh. I.	11 31	II. Oc. D.	20 41	I. Tr. I.	29 0 52	I. Tr. E.
18 50	I. Tr. E.	15 8.7	II. Ec. R.	21 12	I. Sh. I.	1 16	I. Sh. E.
19 33	I. Sh. E.	18 40	I. Tr. I.	22 51	I. Tr. E.	19 52	I. Oc. D.
		19 18	I. Sh. I.	23 22	I. Sh. E.	22 26.3	I. Ec. R.
8 13 48	I. Oc. D.	20 50	I. Tr. E.				
		21 27	I. Sh. E.	22 17 50	I. Oc. D.		
				20 31.6	I. Ec. R.		
		15 15 49	I. Oc. D.	23 8 36	II. Tr. I.		
		18 36.9	I. Ec. R.				

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from October 30 to December 16.

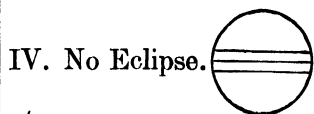
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 11^h 15^m for an Inverting Telescope.

Day.	West.	East.
1	•4	•1 2• 3•
2	○1• •4 2•	○ 3•
3	•4 •2 3•	○ •1
4	3• •4 1•	○ •2
5	•3	○2• •4 1
6	2• •1 3	○ •4
7		○ 1• •3 •4 •2 ●
8		•1 ○ 2• •3 •1
9	○1• 2•	○ 3• 4•
10	•2 3•	○ •1 4•
11	3• 1•	○ •2 4•
12	•3	○ 2• •1 4•
13	2• 1• •3 4	○ •2
14	4•	○ 1• •3
15	4•	•1 ○ 2• •3
16	4•	2• ○1• 3•
17	○3• 4• •2	○ •1 ●
18	•4 3• 1•	○ •2
19	•4 •3	○ •1 2•
20	•4 2• •3 1•	○
21	•4 •2	○ •3 1•
22	•1	○ •4 •2 •3
23		○ 1• 3• •4
24	•2	○ •1 3• •4
25	○1• 3•	○ •2 •4
26	3•	○ •1 2• 4•
27	•3 2• 1•	○ 4•
28	•2	○ •3 •1 4•
29	•1	○ 4• •2 •3

GREENWICH MEAN TIME.

DECEMBER.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from October 30 to December 16.

d h m		d h m		d h m		d h m	
17 11 16.2	III. Ec. D.	21 3 1	III. Tr. I.	24 17 21	III. Oc. D.	28 9 37	III. Tr. E.
11 55.3	II. Ec. D.	3 10	III. Sh. E.	17 53	II. Oc. R.		
12 23	I. Sh. I.	3 30	I. Sh. E.	19 33	III. Oc. R.	29 0 27.6	I. Ec. D.
12 48	I. Tr. I.	3 59	I. Tr. E.			3 16	I. Oc. R.
14 33	I. Sh. E.	4 30	II. Oc. R.	25 11 30.6	I. Ec. D.	21 42	I. Sh. I.
14 58	I. Tr. E.	5 12	III. Tr. E.	14 15	I. Oc. R.	22 18	I. Tr. I.
15 6	III. Oc. R.	22 33.6	I. Ec. D.			22 26	II. Sh. I.
15 6	II. Oc. R.			26 8 45	I. Sh. I.	23 41	II.*Tr. I.
		22 1 15	I. Oc. R.	9 8	II. Sh. I.	23 51	I.*Sh. E.
18 9 36.5	I. Ec. D.	19 49	I. Sh. I.	9 18	I. Tr. I.		
12 14	I. Oc. R.	19 50	II. Sh. I.	10 17	II. Tr. I.	30 0 28	I. Tr. E.
		20 18	I. Tr. I.	10 55	I. Sh. E.	0 46	II. Sh. E.
19 6 32	II. Sh. I.	20 51	II. Tr. I.	11 28	II. Sh. E.	2 3	II. Tr. E.
6 52	I. Sh. I.	21 58	I. Sh. E.	11 29	I. Tr. E.	18 56.2	I. Ec. D.
7 18	I. Tr. I.	22 10	II. Sh. E.	12 39	II. Tr. E.	21 46	I. Oc. R.
7 26	II. Tr. I.	22 29	I. Tr. E.				
8 52	II. Sh. E.	23 13	II.*Tr. E.	27 5 59.2	I. Ec. D.	31 16 10	I. Sh. I.
9 1	I. Sh. E.			8 45	I. Oc. R.	16 48	I. Tr. I.
9 28	I. Tr. E.	23 17 2.2	I. Ec. D.			17 1.8	II. Ec. D.
9 49	II. Tr. E.	19 45	I. Oc. R.	28 3 14	I. Sh. I.	18 20	I. Sh. E.
				3 45.2	II. Ec. D.	18 58	I. Tr. E.
20 4 5.1	I. Ec. D.	24 14 17	I. Sh. I.	3 48	I. Tr. I.	19 12.8	III. Ec. D.
6 45	I. Oc. R.	14 28.6	II. Ec. D.	5 9	III. Sh. I.	20 39	II. Oc. R.
		14 48	I. Tr. I.	5 23	I. Sh. E.	21 15.3	III. Ec. R.
21 1 10	III. Sh. I.	15 14.8	III. Ec. D.	5 58	I. Tr. E.	21 47	III. Oc. D.
1 12.0	II. Ec. D.	16 26	I. Sh. E.	7 8	III. Sh. E.	23 59	III. Oc. R.
1 20	I. Sh. I.	16 59	I. Tr. E.	7 16	II. Oc. R.		
1 48	I. Tr. I.	17 16.4	III. Ec. R.	7 26	III. Tr. I.		

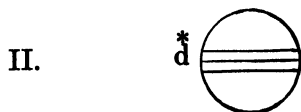
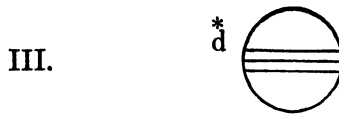
NOTE.—I. denotes ingress; E., egress; D., disappearance; R., reappearance; Ec., eclipse; Oc., occultation; Tr., transit of the satellite; Sh., transit of the shadow.

*Visible at Washington.

GREENWICH MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 23^h 30^m for an Inverting Telescope.

Day.	West.	East.
1		○
2		○
3		○
4		○
5		○
6		○
7		○
8		○
9		○
10		○
11		○
12		○
13		○
14		○
15		○
16		○
17	1•	○ ³ ₂ 4•
18		○ ¹ ₂ 4• 3•
19	2• 1•	○ ⁴ ₃ 3•
20	4•	○ ² ₃ ¹ ₃
21	4• 3•	○ 2• 1•
22	4• 3•	○ ¹ ₂ 1•
23	4• ³ ₂	○ 1•
24	4• 1•	○ ³ ₂
25	4•	○ ¹ ₂ 3•
26	4• 2• 1•	○ 3•
27		○ ⁴ ₂ ¹ ₃
28	3•	○ 1• 4• 2•
29	○ 1• 3•	○ ² ₃ 4•
30	3• 2•	○ 1• 4•
31	1•	○ 2• 4• 3•

656 MAGNITUDE AND RINGS OF SATURN, 1923.

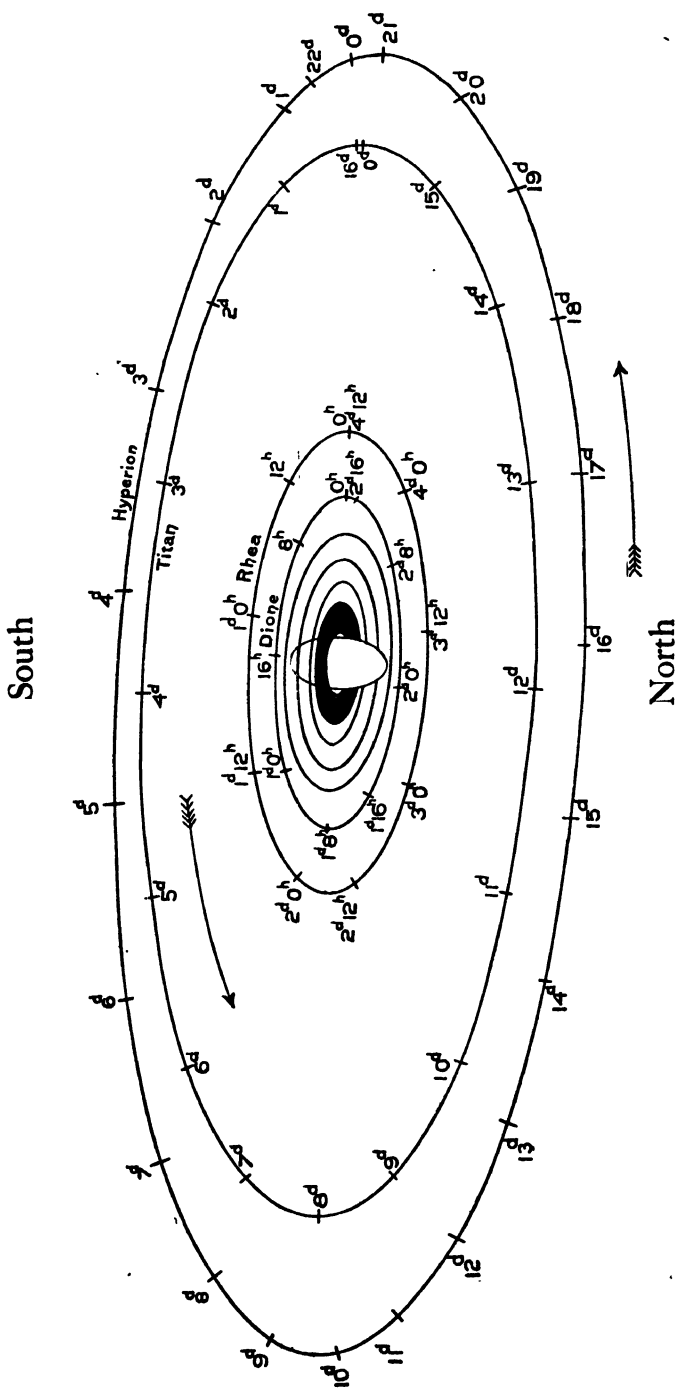
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEAR-
ANCE, AND MAGNITUDE OF SATURN'S RINGS.

Greenwich Mean Midnight.		<i>a</i>	<i>b</i>	<i>P</i>	<i>B</i>	<i>U</i>	ω	<i>B'</i>	<i>U'</i>	Stellar Mag.
		° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	° ' ''	
Jan.	2	38.66	+ 7.93	-2 12.1	+11 50.6	71 14.2	42 13.1	+ 9 22.3	23 40.2	+0.9
	10	39.19	8.11	2 10.0	11 56.5	71 32.8	42 13.1	9 29.0	23 54.6	0.9
	18	39.74	8.26	2 8.5	11 59.6	71 45.4	42 13.1	9 35.7	24 9.1	0.9
	26	40.29	8.38	2 7.8	11 59.9	71 51.7	42 13.0	9 42.4	24 23.6	0.8
Feb.	3	40.84	8.46	2 7.8	11 57.4	71 51.5	42 13.0	9 49.0	24 38.1	0.8
	11	41.37	+ 8.51	-2 8.6	+11 52.3	71 45.1	42 13.0	+ 9 55.7	24 52.6	+0.8
	19	41.86	8.52	2 10.0	11 44.5	71 32.5	42 12.9	10 2.4	25 7.1	0.7
	27	42.31	8.49	2 12.0	11 34.5	71 14.3	42 12.9	10 9.0	25 21.6	0.7
Mar.	7	42.69	8.42	2 14.6	11 22.4	70 51.1	42 12.8	10 15.6	25 36.1	0.6
	15	43.00	8.31	2 17.6	11 8.8	70 23.6	42 12.8	10 22.2	25 50.6	0.6
	23	43.22	+ 8.17	-2 21.0	+10 53.9	69 52.8	42 12.8	+10 28.8	26 5.1	+0.6
	31	43.35	8.00	2 24.7	10 38.3	69 19.8	42 12.7	10 35.3	26 19.6	0.5
Apr.	8	43.38	7.81	2 28.4	10 22.5	68 45.8	42 12.7	10 41.9	26 34.1	0.5
	16	43.32	7.61	2 32.1	10 7.1	68 11.9	42 12.6	10 48.4	26 48.7	0.6
	24	43.16	7.40	2 35.7	9 52.5	67 39.2	42 12.6	10 55.0	27 3.2	0.6
May	2	42.91	+ 7.19	-2 39.0	+ 9 39.4	67 8.8	42 12.6	+11 1.5	27 17.7	+0.7
	10	42.58	7.00	2 41.9	9 28.0	66 41.7	42 12.5	11 8.0	27 32.3	0.7
	18	42.18	6.83	2 44.4	9 18.8	66 18.7	42 12.5	11 14.5	27 46.8	0.8
	26	41.72	6.67	2 46.4	9 12.1	66 0.5	42 12.5	11 20.9	28 1.3	0.8
June	3	41.22	6.54	2 47.8	9 8.0	65 47.6	42 12.4	11 27.4	28 15.9	0.9
	11	40.70	+ 6.44	-2 48.6	+ 9 6.7	65 40.2	42 12.4	+11 33.8	28 30.4	+0.9
	19	40.15	6.37	2 48.8	9 8.2	65 38.7	42 12.4	11 40.2	28 44.9	1.0
	27	39.60	6.34	2 48.3	9 12.5	65 42.9	42 12.3	11 46.6	28 59.5	1.0
July	5	39.06	6.33	2 47.2	9 19.5	65 53.0	42 12.3	11 53.0	29 14.0	1.0
	13	38.53	6.35	2 45.5	9 29.1	66 8.6	42 12.2	11 59.4	29 28.6	1.0
	21	38.02	+ 6.40	-2 43.3	+ 9 41.1	66 29.7	42 12.2	+12 5.8	29 43.2	+1.1
	29	37.54	6.47	2 40.4	9 55.4	66 55.9	42 12.2	12 12.1	29 57.7	1.1
Aug.	6	37.09	6.56	2 37.1	10 11.6	67 26.9	42 12.1	12 18.5	30 12.3	1.1
	14	36.68	6.68	2 33.2	10 29.6	68 2.3	42 12.1	12 24.8	30 26.9	1.1
	22	36.31	6.82	2 28.9	10 49.2	68 41.6	42 12.0	12 31.1	30 41.5	1.1
	30	35.98	+ 6.97	-2 24.2	+11 10.1	69 24.6	42 12.0	+12 37.4	30 56.1	+1.0
Sept.	7	35.71	7.14	2 19.1	11 32.1	70 10.8	42 12.0	12 43.6	31 10.7	1.0
	15	35.48	7.32	2 13.7	11 54.8	70 59.6	42 11.9	12 49.9	31 25.3	1.0
	23	35.30	7.52	2 8.0	12 18.0	71 50.7	42 11.9	12 56.1	31 39.9	1.0
	Oct. 1	35.17	7.73	2 2.0	12 41.6	72 43.5	42 11.9	13 2.3	31 54.5	1.0
	9	35.09	+ 7.95	-1 55.9	+13 5.2	73 37.7	42 11.8	+13 8.5	32 9.2	+0.9
	17	35.07	8.17	1 49.7	13 28.6	74 32.6	42 11.8	13 14.7	32 23.8	0.9
	25	35.10	8.41	1 43.4	13 51.6	75 27.7	42 11.8	13 20.9	32 38.4	0.9
	Nov. 2	35.19	8.65	1 37.1	14 13.9	76 22.5	42 11.7	13 27.0	32 53.0	0.9
	10	35.33	8.90	1 30.8	14 35.3	77 16.5	42 11.7	13 33.2	33 7.7	0.9
	18	35.52	+ 9.15	-1 24.7	+14 55.6	78 9.0	42 11.6	+13 39.3	33 22.3	+0.9
	26	35.76	9.40	1 18.9	15 14.6	78 59.5	42 11.6	13 45.4	33 37.0	0.9
	Dec. 4	36.05	9.65	1 13.3	15 32.0	79 47.4	42 11.6	13 51.5	33 51.6	0.9
	12	36.38	9.91	1 8.0	15 47.8	80 32.1	42 11.5	13 57.5	34 6.3	0.9
	20	36.77	10.15	1 3.2	16 1.8	81 12.9	42 11.5	14 3.6	34 21.0	0.9
	28	37.20	+10.40	-0 58.9	+16 13.7	81 49.3	42 11.4	+14 9.6	34 35.6	+0.9
	36	37.66	+10.63	-0 55.2	+16 23.5	82 20.8	42 11.4	+14 15.6	34 50.3	+0.9

The factor to be multiplied by *a* and *b* to obtain the axes of—

- | | |
|---|-------------------|
| The inner ellipse of the outer ring=0.8801, | log factor=9.9445 |
| The outer ellipse of the inner ring=0.8599, | log factor=9.9344 |
| The inner ellipse of the inner ring=0.6650, | log factor=9.8228 |
| The inner ellipse of the dusky ring=0.5486, | log factor=9.7392 |

NOTE.—The positive sign of *B* indicates that the visible surface of the rings is the northern one.



NAMES OF THE SATELLITES.

I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phoebe.

MEAN SYNODIC PERIODS.

	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,
AT DATE OF OPPOSITION, APRIL 7, 1923, AS SEEN IN AN IN-
VERTING TELESCOPE, AND ELONGATED IN THE RATIO OF TWO
TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

GREENWICH MEAN TIME.

In the diagram on the preceding page the points of the orbits marked "0" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular, and the time of any greatest elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. For Titan, Hyperion, and Iapetus the eccentricity is taken into account, and for Iapetus the time both of the greatest elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., Eastern Elongation. I., Inferior Conjunction (south of planet).
W., Western Elongation. S., Superior Conjunction (north of planet).

MIMAS.

Greatest Elongations Visible in the United States.

	d h		d h		d h		d h		d h		d h
Jan.	3 1.7 E.	Feb.	11 15.6 E.	Mar.	18 1.1 W.	Apr.	18 14.6 E.	May	24 21.4 W.	July	15 17.5 W.
	4 0.4 E.		13 1.6 W.		18 23.7 W.		19 13.3 E.		25 20.0 W.		16 16.1 W.
	4 23.0 E.		14 0.2 W.		19 22.3 W.		20 0.6 W.		26 18.6 W.		17 14.8 W.
	5 21.6 E.		14 22.8 W.		20 20.9 W.		20 23.2 W.		27 17.2 W.		18 13.4 W.
	6 20.2 E.		15 21.4 W.		21 19.6 W.		21 21.8 W.		28 15.8 W.		23 17.8 E.
	7 18.8 E.		16 20.0 W.		22 18.2 W.		22 20.4 W.		29 14.5 W.		24 16.4 E.
	11 2.0 W.		17 18.6 W.		23 16.8 W.		23 19.0 W.		30 13.1 W.		25 15.0 E.
	12 0.6 W.		18 17.3 W.		24 15.4 W.		24 17.6 W.	June	1 21.6 E.		26 13.7 E.
	12 23.2 W.		19 15.9 W.		25 14.0 W.		25 16.3 W.		2 20.2 E.	Aug.	1 16.7 W.
	13 21.8 W.		21 1.8 E.		26 1.3 E.		26 14.9 W.		3 18.9 E.		2 15.3 W.
	14 20.5 W.		22 0.4 E.		26 12.6 W.		27 13.5 W.		4 17.5 E.		3 14.0 W.
	15 19.1 W.		22 23.0 E.		26 23.9 E.		28 23.4 E.		5 16.1 E.		4 12.6 W.
	16 17.7 W.		23 21.6 E.		27 22.5 E.		29 22.0 E.		6 14.7 E.		9 17.0 E.
	19 2.2 E.		24 20.3 E.		28 21.1 E.		30 20.6 E.		7 13.3 E.		10 15.6 E.
	20 0.9 E.		25 18.9 E.		29 19.8 E.	May	1 19.3 E.		10 20.5 W.		11 14.3 E.
	20 23.5 E.		26 17.5 E.		30 18.4 E.		2 17.9 E.		11 19.1 W.		12 12.9 E.
	21 22.1 E.		27 16.1 E.		31 17.0 E.		3 16.5 E.		12 17.8 W.		.....
	22 20.7 E.		28 14.7 E.	Apr.	1 15.6 E.		4 15.1 E.		13 16.4 W.		.....
	23 19.3 E.	Mar.	1 2.0 W.		2 14.2 E.		5 13.7 E.		14 15.0 W.	Dec.	5 1.8 W.
	24 17.9 E.		2 0.6 W.		3 12.8 E.		6 12.3 E.		15 13.6 W.		6 0.4 W.
	27 2.5 W.		2 23.3 W.		4 0.1 W.		7 22.3 W.		19 19.4 E.		6 23.1 W.
	28 1.1 W.		3 21.9 W.		4 22.8 W.		8 20.9 W.		20 18.0 E.		7 21.7 W.
	28 23.7 W.		4 20.5 W.		5 21.4 W.		9 19.5 W.		21 16.6 E.		13 2.1 E.
	29 22.3 W.		5 19.1 W.		6 20.0 W.		10 18.1 W.		22 15.3 E.		14 0.7 E.
	30 21.0 W.		6 17.7 W.		7 18.6 W.		11 16.7 W.		23 13.9 E.		14 23.3 E.
	31 19.6 W.		7 16.3 W.		8 17.2 W.		12 15.3 W.		27 19.7 W.		15 22.0 E.
Feb.	1 18.2 W.		8 14.9 W.		9 15.8 W.		13 14.0 W.		28 18.3 W.		16 20.6 E.
	2 16.8 W.		10 0.9 E.		10 14.4 W.		14 12.6 W.		29 16.9 W.		21 2.4 W.
	4 2.7 E.		10 23.5 E.		11 13.0 W.		15 22.5 E.		30 15.5 W.		22 1.0 W.
	5 1.3 E.		11 22.1 E.		12 0.4 E.		16 21.1 E.	July	1 14.2 W.		22 23.6 W.
	6 0.0 E.		12 20.7 E.		12 23.0 E.		17 19.7 E.		6 18.6 E.		23 22.2 W.
	6 22.6 E.		13 19.3 E.		13 21.6 E.		18 18.4 E.		7 17.2 E.		24 20.9 W.
	7 21.1 E.		14 17.9 E.		14 20.2 E.		19 17.0 E.		8 15.8 E.		29 2.7 E.
	8 19.8 E.		15 16.5 E.		15 18.8 E.		20 15.6 E.		9 14.5 E.		30 1.3 E.
	9 18.4 E.		16 15.2 E.		16 17.4 E.		21 14.2 E.		10 13.1 E.		30 23.9 E.
	10 17.0 E.		17 13.8 E.		17 16.0 E.		22 12.8 E.		14 18.9 W.		31 22.5 E.

GREENWICH MEAN TIME.

ENCELADUS.

Jan.	d h	Feb.	d h	Mar.	d h	Apr.	d h	June	d h	July	d h
	1 5.7 E.		9 23.4 E.		21 16.8 E.		30 10.3 E.		9 3.8 E.		18 21.7 E.
	2 14.6 E.		11 8.3 E.		23 1.7 E.		May 1 19.1 E.		10 12.7 E.		20 6.6 E.
	3 23.5 E.		12 17.1 E.		24 10.6 E.		3 4.0 E.		11 21.6 E.		21 15.5 E.
	5 8.4 E.		14 2.0 E.		25 19.4 E.		4 12.9 E.		13 6.5 E.		23 0.3 E.
	6 17.3 E.		15 10.9 E.		27 4.3 E.		5 21.8 E.		14 15.4 E.		24 9.2 E.
	8 2.2 E.		16 19.8 E.		28 13.2 E.		7 6.6 E.		16 0.3 E.		25 18.1 E.
	9 11.1 E.		18 4.7 E.		29 22.1 E.		8 15.5 E.		17 9.2 E.		27 3.0 E.
	10 20.0 E.		19 13.5 E.		31 7.0 E.		10 0.4 E.		18 18.1 E.		28 11.9 E.
	12 4.8 E.		20 22.4 E.	Apr.	1 15.8 E.		11 9.3 E.		20 2.9 E.		29 20.8 E.
	13 13.7 E.		22 7.3 E.		3 0.7 E.		12 18.2 E.		21 11.8 E.		31 5.7 E.
	14 22.6 E.		23 16.2 E.		4 9.6 E.		14 3.0 E.		22 20.7 E.	Aug.	1 14.6 E.
	16 7.5 E.		25 1.0 E.		5 18.5 E.		15 11.9 E.		24 5.6 E.		2 23.5 E.
	17 16.4 E.		26 9.9 E.		7 3.3 E.		16 20.8 E.		25 14.5 E.		4 8.4 E.
	19 1.3 E.		27 18.8 E.		8 12.2 E.		18 5.7 E.		26 23.4 E.		5 17.3 E.
	20 10.1 E.	Mar.	1 3.7 E.		9 21.1 E.		19 14.6 E.		28 8.3 E.		7 2.2 E.
	21 19.0 E.		2 12.6 E.		11 6.0 E.		20 23.5 E.		29 17.2 E.		8 11.1 E.
	23 3.9 E.		3 21.4 E.		12 14.8 E.		22 8.3 E.	July	1 2.1 E.		9 20.0 E.
	24 12.8 E.		5 6.3 E.		13 23.7 E.		23 17.2 E.		2 11.0 E.		.....
	25 21.7 E.		6 15.2 E.		15 8.6 E.		25 2.1 E.		3 19.8 E.		.....
	27 6.6 E.		8 0.1 E.		16 17.5 E.		26 11.0 E.		5 4.7 E.	Dec.	19 10.2 E.
	28 15.4 E.		9 8.9 E.		18 2.4 E.		27 19.9 E.		6 13.6 E.		20 19.1 E.
	30 0.3 E.		10 17.8 E.		19 11.2 E.		29 4.8 E.		7 22.5 E.		22 4.0 E.
	31 9.2 E.		12 2.7 E.		20 20.1 E.		30 13.6 E.		9 7.4 E.		23 12.9 E.
Feb.	1 18.1 E.		13 11.6 E.		22 5.0 E.		31 22.5 E.		10 16.3 E.		24 21.8 E.
	3 3.0 E.		14 20.4 E.		23 13.9 E.	June	2 7.4 E.		12 1.2 E.		26 6.7 E.
	4 11.8 E.		16 5.3 E.		24 22.7 E.		3 16.3 E.		13 10.1 E.		27 15.6 E.
	5 20.7 E.		17 14.2 E.		26 7.6 E.		5 1.2 E.		14 19.0 E.		29 0.4 E.
	7 5.6 E.		18 23.1 E.		27 16.5 E.		6 10.1 E.		16 3.9 E.		30 9.3 E.
	8 14.5 E.		20 7.9 E.		29 1.4 E.		7 19.0 E.		17 12.8 E.		31 18.2 E.

TETHYS.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	June	d h	July	d h
	2 7.6 E.		10 23.0 E.		22 14.2 E.		1 5.3 E.		9 20.6 E.		19 12.3 E.
	4 4.9 E.		12 20.3 E.		24 11.5 E.		3 2.6 E.		11 18.0 E.		21 9.6 E.
	6 2.2 E.		14 17.6 E.		26 8.8 E.		4 23.9 E.		13 15.3 E.		23 6.9 E.
	7 23.5 E.		16 14.9 E.		28 6.1 E.		6 21.2 E.		15 12.6 E.		25 4.2 E.
	9 20.8 E.		18 12.2 E.		30 3.4 E.		8 18.5 E.		17 9.9 E.		27 1.6 E.
	11 18.2 E.		20 9.5 E.	Apr.	1 0.7 E.		10 15.8 E.		19 7.2 E.		28 22.9 E.
	13 15.5 E.		22 6.8 E.		2 22.0 E.		12 13.1 E.		21 4.5 E.		30 20.2 E.
	15 12.8 E.		24 4.1 E.		4 19.2 E.		14 10.4 E.		23 1.8 E.	Aug.	1 17.6 E.
	17 10.1 E.		26 1.4 E.		6 16.5 E.		16 7.7 E.		24 23.1 E.		3 14.9 E.
	19 7.4 E.		27 22.7 E.		8 13.8 E.		18 5.0 E.		26 20.5 E.		5 12.2 E.
	21 4.7 E.	Mar.	1 20.0 E.		10 11.1 E.		20 2.3 E.		28 17.8 E.		7 9.5 E.
	23 2.0 E.		3 17.3 E.		12 8.4 E.		21 23.6 E.		30 15.1 E.		.....
	24 23.3 E.		5 14.6 E.		14 5.7 E.		23 20.9 E.	July	2 12.4 E.		.....
	26 20.6 E.		7 11.9 E.		16 3.0 E.		25 18.2 E.		4 9.7 E.	Dec.	17 14.7 E.
	28 17.9 E.		9 9.2 E.		18 0.3 E.		27 15.5 E.		6 7.0 E.		19 12.1 E.
	30 15.2 E.		11 6.5 E.		19 21.6 E.		29 12.8 E.		8 4.4 E.		21 9.4 E.
Feb.	1 12.5 E.		13 3.8 E.		21 18.8 E.		31 10.1 E.		10 1.7 E.		23 6.7 E.
	3 9.8 E.		15 1.0 E.		23 16.1 E.	June	2 7.4 E.		11 23.0 E.		25 4.0 E.
	5 7.1 E.		16 22.3 E.		25 13.4 E.		4 4.7 E.		13 20.3 E.		27 1.4 E.
	7 4.4 E.		18 19.6 E.		27 10.7 E.		6 2.0 E.		15 17.6 E.		28 22.7 E.
	9 1.7 E.		20 16.9 E.		29 8.0 E.		7 23.3 E.		17 15.0 E.		30 20.0 E.

SATELLITES OF SATURN, 1923.

GREENWICH MEAN TIME.

DIONE.

Jan.	d h	Feb.	d h	Mar.	d h	May	d h	June	d h	July	d h
	3 2.7 E.		13 4.0 E.		26 4.9 E.		6 5.7 E.		16 6.8 E.		27 8.4 E.
	5 20.4 E.		15 21.7 E.		28 22.5 E.		8 23.4 E.		19 0.5 E.		30 2.1 E.
	8 14.1 E.		18 15.4 E.		31 16.2 E.		11 17.0 E.		21 18.2 E.	Aug.	1 19.8 E.
	11 7.8 E.		21 9.0 E.	Apr.	3 9.8 E.		14 10.7 E.		24 11.9 E.		4 13.6 E.
	14 1.5 E.		24 2.7 E.		6 3.5 E.		17 4.4 E.		27 5.6 E.		7 7.3 E.
	16 19.2 E.		26 20.3 E.		8 21.1 E.		19 22.0 E.		29 23.3 E.		10 1.0 E.
	19 12.9 E.	Mar.	1 14.0 E.		11 14.8 E.		22 15.7 E.	July	2 217.0 E.		. . . . .
	22 6.6 E.		4 7.7 E.		14 8.4 E.		25 9.4 E.		5 10.7 E.		. . . . .
	25 0.3 E.		7 1.3 E.		17 2.1 E.		28 3.0 E.		8 4.4 E.	Dec.	14 1.0 E.
	27 18.0 E.		9 19.0 E.		19 19.8 E.		30 20.7 E.		10 22.1 E.		16 18.7 E.
Feb.	30 11.6 E.		12 12.6 E.		22 13.4 E.	June	2 14.4 E.		13 15.8 E.		19 12.4 E.
	2 5.3 E.		15 6.3 E.		25 7.1 E.		5 8.1 E.		16 9.5 E.		22 6.1 E.
	4 23.0 E.		17 23.9 E.		28 0.7 E.		8 1.8 E.		19 3.3 E.		24 23.9 E.
	7 15.7 E.		20 17.6 E.		30 18.4 E.		10 19.5 E.		21 21.0 E.		27 17.6 E.
	10 10.4 E.		23 11.2 E.	May	3 12.0 E.		13 13.1 E.		24 14.7 E.		30 11.3 E.

RHEA.

	d h		d h		d h		d h		d h		d h
Jan.	4 22.6 E.	Feb.	14 14.4 E.	Mar.	27 5.5 E.	May	6 20.5 E.	June	16 12.0 E.	July	27 4.2 E.
	9 11.1 E.		19 2.8 E.		31 17.9 E.		11 8.9 E.		21 0.4 E.		31 16.7 E.
	13 23.5 E.		23 15.2 E.	Apr.	5 6.2 E.		15 21.2 E.		25 12.9 E.	Aug.	5 5.2 E.
	18 12.0 E.		28 3.5 E.		9 18.5 E.		20 9.6 E.		30 1.3 E.		9 17.8 E.
	23 0.4 E.	Mar.	4 15.9 E.		14 6.8 E.		24 22.0 E.	July	4 13.8 E.		.....
	27 12.8 E.		9 4.2 E.		18 19.2 E.		29 10.4 E.		9 2.2 E.		.....
Feb.	1 1.2 E.		13 16.5 E.		23 7.5 E.	June	2 22.8 E.		13 14.7 E.	Dec.	23 10.5 E.
	5 13.6 E.		18 4.9 E.		27 19.8 E.		7 11.2 E.		18 3.2 E.		27 23.0 E.
	10 2.0 E.		22 17.2 E.	May	2 8.2 E.		11 23.6 E.		22 15.7 E.		32 11.5 E.

TITAN.

Jan.		Feb.		Apr.		May		July		Dec.	
d	h	d	h	d	h	d	h	d	h	d	h
4	0.3 E.	20	20.5 E.	9	13.7 E.	27	7.1 E.	14	3.5 E.		
11	23.3 W.	28	18.8 W.	17	11.4 W.	4	4.8 W.	22	1.9 W.		
19	23.5 E.	Mar. 8	18.4 E.	25	11.3 E.	12	5.5 E.	30	3.0 E.		
27	22.2 W.	16	16.4 W.	May 3	8.9 W.	20	3.4 W.	Aug. 7	1.7 W.		
Feb. 4	22.2 E.	24	16.1 E.	11	9.1 E.	28	4.3 E.	15	2.9 E.		
12	20.7 W.	Apr. 1	13.9 W.	19	6.7 W.	July 6	2.4 W.	23	1.8 W.		
										29	6.1 W.

HYPERION.

Jan.	d h 11 5.4 E. 20 13.2 W.	Feb.	d h 22 23.1 E. Mar. 4 6.3 W. 16 6.9 E. 25 13.7 W.	Apr.	d h 6 14.4 E. 15 20.7 W. 27 21.7 E. May 7 3.9 W.	May	d h 19 5.2 E. 28 11.6 W. June 9 13.1 E. 18 19.9 W.	June	d h 30 21.4 E. July 10 4.9 W. 22 6.0 E. 31 14.5 W.	Aug.	d h 12 14.9 E. Dec. 18 14.0 E. 28 7.3 W.
------	--------------------------------	------	---	------	--	-----	--	------	--	------	--

IAPETUS.

Jan.	d h 17 13.5 W.	Feb.	d h 27 11.4 E.	Apr.	d h 6 4.6 W.	May	d h 16 15.8 E.	June	d h 23 17.8 W.	Aug.	d h 4 5.5 E.
Feb.	7 8.5 S.	Mar.	18 3.8 I.		26 14.0 S.	June	4 11.5 I.	July	14 14.3 S.	Dec.	24 2.6 S.

DIFFERENTIAL COORDINATES OF PHOEBE.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$	Date.	$\alpha_{Ph.} - \alpha_{Sat.}$	$\delta_{Ph.} - \delta_{Sat.}$
	m s	' "		m s	' "		m s	' "
Jan. 1	+0 55.5	-6 34	Apr. 15	-1 11.8	+ 9 26	July 28	-2 5.1	+15 48
3	0 53.4	6 19	17	1 13.8	9 42	30	2 5.1	15 47
5	0 51.2	6 3	19	1 15.8	9 57	Aug. 1	2 5.0	15 45
7	0 49.0	5 47	21	1 17.8	10 12	3	2 4.8	15 43
9	0 46.8	5 30	23	1 19.7	10 27	5	2 4.6	15 40
11	+0 44.5	-5 13	25	-1 21.6	+10 41	7	-2 4.3	+15 37
13	0 42.2	4 55	27	1 23.4	10 56	9	2 4.1	15 34
15	0 39.9	4 38	29	1 25.2	11 10	11	2 3.7	15 30
17	0 37.5	4 20	May 1	1 27.0	11 23	13	2 3.3	15 26
19	0 35.0	4 1	3	1 28.7	11 36	15	2 2.9	15 22
21	+0 32.6	-3 43	5	-1 30.4	+11 49	17	-2 2.5	+15 18
23	0 30.1	3 24	7	1 32.1	12 2	19	2 2.0	15 13
25	0 27.5	3 6	9	1 33.7	12 14	21	2 1.4	15 8
27	0 25.0	2 47	11	1 35.2	12 26	23	2 0.8	15 2
29	0 22.5	2 28	13	1 36.8	12 38	25	2 0.2	14 56
31	+0 19.9	-2 8	15	-1 38.3	+12 49	27	-1 59.6	+14 50
Feb. 2	0 17.3	1 49	17	1 39.7	13 0	29	1 58.9	14 44
4	0 14.6	1 30	19	1 41.2	13 11	31	1 58.1	14 37
6	0 12.0	1 10	21	1 42.5	13 21	Sept. 2	1 57.3	14 30
8	0 9.4	0 50	23	1 43.9	13 31	4	1 56.4	14 23
10	+0 6.7	-0 30	25	-1 45.2	+13 41	6	-1 55.6	+14 15
12	0 4.0	-0 11	27	1 46.4	13 50	8	1 54.6	14 7
14	+0 1.4	+0 9	29	1 47.7	13 59	10	1 53.7	13 59
16	-0 1.3	0 29	31	1 48.8	14 8	12	1 52.7	13 50
18	0 3.9	0 49	June 2	1 50.0	14 16	14	1 51.6	13 41
20	-0 6.6	+1 9	4	-1 51.1	+14 24	16	-1 50.5	+13 32
22	0 9.2	1 29	6	1 52.1	14 31	..	....	....
24	0 11.9	1 49	8	1 53.2	14 39	..	....	....
26	0 14.5	2 8	10	1 54.2	14 46	Nov. 16	-0 58.0	+ 6 53
28	0 17.2	2 28	12	1 55.1	14 52	18	0 55.7	6 37
Mar. 2	-0 19.8	+2 48	14	-1 56.0	+14 58	20	-0 53.4	+ 6 20
4	0 22.4	3 7	16	1 56.8	15 4	22	0 51.1	6 4
6	0 25.0	3 27	18	1 57.6	15 10	24	0 48.7	5 47
8	0 27.5	3 47	20	1 58.4	15 15	26	0 46.3	5 30
10	0 30.1	4 6	22	1 59.2	15 20	28	0 43.9	5 13
12	-0 32.6	+4 25	24	-1 59.9	+15 24	30	-0 41.4	+ 4 56
14	0 35.2	4 44	26	2 0.5	15 28	Dec. 2	0 39.0	4 39
16	0 37.7	5 3	28	2 1.1	15 32	4	0 36.5	4 22
18	0 40.1	5 22	30	2 1.7	15 36	6	0 33.9	4 4
20	0 42.6	5 41	July 2	2 2.2	15 39	8	0 31.4	3 47
22	-0 45.0	+6 0	4	-2 2.7	+15 41	10	-0 28.8	+ 3 29
24	0 47.4	6 18	6	2 3.1	15 44	12	0 26.3	3 11
26	0 49.8	6 36	8	2 3.5	15 46	14	0 23.7	2 54
28	0 52.1	6 54	10	2 3.8	15 48	16	0 21.1	2 36
30	0 54.4	7 12	12	2 4.1	15 49	18	0 18.4	2 18
Apr. 1	-0 56.7	+7 30	14	-2 4.4	+15 50	20	-0 15.8	+ 2 0
3	0 59.0	7 47	16	2 4.6	15 50	22	0 13.1	1 42
5	1 1.2	8 4	18	2 4.8	15 51	24	0 10.5	1 24
7	1 3.4	8 21	20	2 5.0	15 51	26	0 7.8	1 6
9	1 5.6	8 38	22	2 5.1	15 51	28	0 5.1	0 48
11	-1 7.7	+8 54	24	-2 5.1	+15 51	30	-0 2.4	+ 0 30
13	-1 9.8	+9 10	26	-2 5.2	+15 50	32	+0 0.3	+ 0 11

Time from Eastern Elongation.	Mimas.		Time from Eastern Elongation.	Enceladus.		Tethys.		Time from Eastern Elongation.	Dione.	
	p^1	F		p^1	F	p^1	F		p^1	F
h	°		d h	°		°		d h	°	
0.0	88.0	1.000	0 0	88.0	1.000	88.0	1.000	0 0	88.0	1.000
0.5	89.3	0.991	0 1	90.0	0.982	89.5	0.991	0 2	90.0	0.982
1.0	90.7	0.963	0 2	92.2	0.930	91.1	0.963	0 4	92.1	0.930
1.5	92.2	0.917	0 3	94.7	0.846	92.8	0.918	0 6	94.6	0.845
2.0	93.9	0.854	0 4	97.8	0.733	94.7	0.856	0 8	97.8	0.732
2.5	95.8	0.776	0 5	102.3	0.596	97.0	0.779	0 10	102.3	0.595
3.0	98.3	0.683	0 6	109.8	0.444	99.8	0.688	0 12	109.8	0.442
3.5	101.6	0.580	0 7	125.3	0.291	103.5	0.586	0 14	125.3	0.289
4.0	106.5	0.468	0 8	164.8	0.186	108.9	0.477	0 16	165.3	0.184
4.5	114.5	0.352	0 9	217.6	0.232	117.6	0.365	0 18	218.3	0.233
5.0	130.0	0.243	0 10	240.9	0.374	133.6	0.262	0 20	241.2	0.376
5.5	163.4	0.171	0 11	250.9	0.530	164.6	0.195	0 22	251.1	0.532
6.0	208.2	0.190	0 12	256.4	0.675	204.2	0.211	1 0	256.5	0.677
6.5	233.3	0.283	0 13	260.0	0.799	229.2	0.295	1 2	260.1	0.801
7.0	245.1	0.396	0 14	262.8	0.897	241.9	0.403	1 4	262.9	0.898
7.5	251.6	0.511	0 15	265.1	0.964	249.2	0.515	1 6	265.1	0.964
8.0	255.8	0.620	0 16	267.1	0.997	253.9	0.622	1 8	267.2	0.997
8.5	258.7	0.720	0 17	269.1	0.995	257.3	0.721	1 10	269.1	0.994
9.0	261.0	0.807	0 18	271.2	0.958	259.9	0.807	1 12	271.2	0.956
9.5	262.8	0.880	0 19	273.5	0.887	262.0	0.879	1 14	273.5	0.885
10.0	264.4	0.936	0 20	276.3	0.786	263.8	0.936	1 16	276.3	0.783
10.5	265.8	0.976	0 21	280.1	0.659	265.5	0.975	1 18	280.2	0.655
11.0	267.2	0.996	0 22	286.0	0.512	267.0	0.996	1 20	286.1	0.508
11.5	268.5	0.999	0 23	296.8	0.357	268.5	0.999	1 22	297.1	0.352
12.0	269.8	0.982	1 0	322.8	0.220	270.1	0.983	2 0	323.9	0.215
12.5	271.2	0.947	1 1	17.6	0.192	271.7	0.949	2 2	19.4	0.192
13.0	272.9	0.895	1 2	53.3	0.307	273.4	0.898	2 4	54.1	0.311
13.5	274.6	0.826	1 3	67.3	0.461	275.5	0.831	2 6	67.7	0.466
14.0	276.7	0.742	1 4	74.3	0.613	277.9	0.749	2 8	74.6	0.618
14.5	279.5	0.645	1 5	78.6	0.747	281.0	0.654	2 10	78.8	0.751
15.0	283.2	0.538	1 6	81.7	0.857	285.2	0.549	2 12	81.8	0.861
15.5	289.0	0.424	1 7	84.1	0.938	291.5	0.438	2 14	84.2	0.941
16.0	299.1	0.309	1 8	86.2	0.986	302.0	0.327	2 16	86.3	0.987
16.5	319.9	0.208	1 9	88.2	1.000	322.3	0.232	-2 18	88.3	1.000
17.0	1.5	0.166	1 10	90.2	0.978	358.8	0.190	2 20	90.3	0.976
17.5	40.2	0.221	1 11			34.8	0.235			
18.0	58.8	0.325	1 12			54.5	0.331			
18.5	68.0	0.440	1 13			64.8	0.442			
19.0	73.4	0.554	1 14			71.0	0.553			
19.5	77.0	0.660	1 15			75.2	0.658			
20.0	79.6	0.755	1 16			78.2	0.752			
20.5	81.7	0.837	1 17			80.6	0.834			
21.0	83.4	0.904	1 18			82.6	0.901			
21.5	85.0	0.954	1 19			84.4	0.951			
22.0	86.4	0.986	1 20			86.0	0.984			
22.5	87.7	0.999	1 21			87.5	0.999			
23.0	89.0	0.994	1 22			89.0	0.996			

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F \frac{a(p)}{\rho}$.

Time from Eastern Elongation.	Rhea.		Time from Eastern Elongation.	Titan.		Hyperion.		Time from Eastern Elongation.	Iapetus.	
	p^1	F		p^1	F	p^1	F		p^1	F
d h	°		d h	°		°		d	°	
0 0	88.0	1.000	0 0	88.0	0.971	88.0	0.929	0	102.0	0.991
0 3	89.8	0.985	0 10	89.8	0.957	89.4	0.908	2	104.0	0.975
0 6	91.8	0.942	0 20	91.7	0.915	90.9	0.870	4	106.1	0.934
0 9	94.0	0.872	1 6	93.8	0.848	92.6	0.815	6	108.4	0.870
0 12	96.7	0.777	1 16	96.4	0.757	94.5	0.744	8	111.2	0.784
0 15	100.2	0.660	2 2	99.7	0.647	96.9	0.658	10	114.8	0.680
0 18	105.4	0.528	2 12	104.7	0.521	100.2	0.560	12	119.7	0.561
0 21	114.3	0.387	2 22	112.9	0.386	104.8	0.451	14	127.6	0.433
1 0	133.1	0.254	3 8	129.8	0.257	112.6	0.339	16	141.9	0.309
1 3	176.1	0.183	3 18	168.9	0.178	127.9	0.231	18	171.5	0.218
1 6	220.8	0.246	4 4	216.0	0.222	162.4	0.158	20	215.0	0.222
1 9	240.8	0.377	4 14	238.4	0.342	209.5	0.179	22	243.2	0.317
1 12	250.1	0.518	5 0	248.5	0.478	234.5	0.272	24	256.9	0.442
1 15	255.5	0.651	5 10	254.2	0.609	245.9	0.385	26	264.4	0.570
1 18	259.1	0.769	5 20	257.9	0.729	252.1	0.498	28	269.3	0.689
1 21	261.8	0.866	6 6	260.7	0.831	256.0	0.606	30	272.8	0.793
2 0	264.1	0.938	6 16	262.8	0.915	258.8	0.705	32	275.5	0.879
2 3	266.0	0.983	7 2	264.7	0.977	260.9	0.793	34	277.8	0.945
2 6	267.9	1.000	7 12	266.4	1.015	262.6	0.870	36	279.8	0.987
2 9	269.7	0.987	7 22	268.0	1.028	264.1	0.934	38	281.7	1.007
2 12	271.6	0.946	8 8	269.5	1.018	265.4	0.985	40	283.6	1.003
2 15	273.8	0.878	8 18	271.2	0.982	266.5	1.022	42	285.6	0.975
2 18	276.5	0.784	9 4	273.0	0.924	267.6	1.045	44	287.7	0.925
2 21	279.9	0.669	9 14	275.1	0.843	268.7	1.056	46	290.1	0.855
3 0	285.0	0.537	10 0	277.8	0.743	269.8	1.053	48	293.0	0.767
3 3	293.5	0.396	10 10	281.3	0.626	270.9	1.038	50	296.7	0.663
3 6	311.2	0.262	10 20	286.6	0.498	272.0	1.011	52	302.0	0.548
3 9	352.3	0.184	11 6	295.8	0.363	273.2	0.973	54	310.1	0.428
3 12	38.6	0.238	11 16	315.2	0.239	274.5	0.925	56	324.5	0.312
3 15	59.9	0.367	12 2	358.0	0.177	276.0	0.866	58	352.1	0.230
3 18	69.6	0.508	12 12	41.1	0.238	277.7	0.798	60	31.4	0.229
3 21	75.2	0.643	12 22	60.7	0.362	279.8	0.723	62	59.3	0.310
4 0	78.9	0.762	13 8	69.9	0.495	282.3	0.642	64	73.9	0.425
4 3	81.7	0.860	13 18	75.3	0.623	285.6	0.555	66	82.1	0.545
4 6	83.9	0.934	14 4	78.9	0.736	290.2	0.464	68	87.4	0.660
4 9	85.9	0.981	14 14	81.6	0.831	297.1	0.373	70	91.2	0.763
4 12	87.7	1.000	15 0	83.8	0.903	308.2	0.287	72	94.1	0.850
4 15	89.6	0.989	15 10	85.7	0.950	327.5	0.217	74	96.6	0.916
			15 20	87.5	0.970	358.1	0.187	76	98.7	0.965
			16 6	89.3	0.964	29.0	0.215	78	100.7	0.989
			16 16			48.7	0.284	80	102.7	0.988
			17 2			60.0	0.370	82	104.6	0.964
			17 12			67.0	0.460			
			17 22			71.7	0.548			
			18 8			75.1	0.632			
			18 18			77.7	0.710			
			19 4			79.9	0.778			
			19 14			81.7	0.836			
			20 0			83.3	0.882			
			20 10			84.8	0.914			
			20 20			86.2	0.930			
			21 6			87.5	0.932			
			21 16			88.9	0.918			

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F \frac{a(p)}{p}$.

SATELLITES OF SATURN, 1923.

FOR GREENWICH MEAN MIDNIGHT.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$	$P-P_0$	$\frac{a(p)}{p}$
	°	"	°	"	°	"	°	"
Jan. 1	+0.8	26.3	-0.2	33.7	-1.3	41.8	-0.2	53.5
6	0.7	26.5	0.2	34.0	1.2	42.1	0.2	54.0
11	0.6	26.8	0.2	34.3	1.2	42.5	0.1	54.4
16	0.4	27.0	0.2	34.6	1.2	42.9	0.1	54.9
21	0.3	27.2	0.2	34.9	1.2	43.2	0.1	55.4
26	+0.2	27.5	-0.2	35.2	-1.2	43.6	-0.1	55.8
31	0.0	27.7	0.2	35.5	1.2	44.0	0.1	56.3
Feb. 5	-0.1	27.9	0.2	35.8	1.2	44.4	0.1	56.8
10	0.2	28.2	0.2	36.1	1.2	44.7	0.1	57.3
15	0.4	28.4	0.2	36.4	1.2	45.1	0.1	57.7
20	-0.6	28.6	-0.2	36.7	-1.2	45.4	-0.2	58.1
25	0.7	28.8	0.2	36.9	1.2	45.7	0.2	58.5
Mar. 2	0.9	28.9	0.2	37.1	1.2	46.0	0.2	58.8
7	1.0	29.1	0.3	37.3	1.2	46.2	0.2	59.2
12	1.2	29.2	0.3	37.5	1.2	46.4	0.2	59.5
17	-1.3	29.3	-0.3	37.7	-1.3	46.6	-0.3	59.7
22	1.4	29.4	0.4	37.8	1.3	46.8	0.3	59.9
27	1.6	29.5	0.4	37.9	1.3	46.9	0.4	60.0
Apr. 1	1.7	29.6	0.4	37.9	1.4	46.9	0.4	60.1
6	1.8	29.6	0.5	37.9	1.4	47.0	0.4	60.1
11	-1.9	29.6	-0.5	37.9	-1.4	46.9	-0.5	60.1
16	2.0	29.5	0.6	37.9	1.5	46.9	0.5	60.0
21	2.1	29.5	0.6	37.8	1.5	46.8	0.6	59.9
26	2.2	29.4	0.6	37.7	1.5	46.6	0.6	59.7
May 1	2.2	29.3	0.7	37.5	1.6	46.5	0.6	59.5
6	-2.3	29.1	-0.7	37.4	-1.6	46.3	-0.6	59.3
11	2.3	29.0	0.7	37.2	1.6	46.0	0.7	59.0
16	2.4	28.8	0.8	37.0	1.6	45.8	0.7	58.6
21	2.4	28.6	0.8	36.7	1.6	45.5	0.7	58.2
26	2.4	28.4	0.8	36.5	1.6	45.2	0.8	57.8
31	-2.3	28.2	-0.8	36.2	-1.6	44.8	-0.8	57.4
June 5	2.3	28.0	0.8	35.9	1.6	44.5	0.8	57.0
10	2.3	27.8	0.8	35.6	1.6	44.1	0.8	56.5
15	2.2	27.5	0.8	35.3	1.6	43.8	0.8	56.0
20	2.1	27.3	0.8	35.0	1.6	43.4	0.8	55.6
25	-2.0	27.1	-0.8	34.7	-1.6	43.0	-0.8	55.1
30	1.9	26.8	0.8	34.4	1.6	42.6	0.8	54.6
July 5	1.8	26.6	0.8	34.1	1.6	42.3	0.8	54.1
10	1.6	26.4	0.8	33.9	1.5	41.9	0.8	53.7
15	1.5	26.2	0.8	33.6	1.5	41.6	0.7	53.2
20	-1.3	25.9	-0.7	33.3	-1.4	41.2	-0.7	52.8
25	-1.2	25.7	-0.7	33.0	-1.4	40.9	-0.7	52.3
..
Dec. 22	+1.8	25.1	+1.0	32.2	+1.1	39.9	+0.9	51.1
27	1.7	25.3	1.0	32.5	1.1	40.2	1.0	51.5
32	+1.6	25.5	+1.1	32.7	+1.2	40.5	+1.0	51.9

FOR GREENWICH MEAN MIDNIGHT.

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	"	°	"	°	"	°	"
Jan. 1	-0.5	74.7	+0.1	173	-0.4	210	+0.4	505
6	0.5	75.4	0.1	175	0.4	212	0.5	509
11	0.4	76.0	0.1	176	0.4	213	0.5	513
16	0.4	76.7	0.1	178	0.3	215	0.5	518
21	0.4	77.3	0.2	179	0.3	217	0.5	523
26	-0.4	78.0	+0.2	181	-0.3	219	+0.5	527
31	0.4	78.7	0.2	182	0.3	221	0.5	532
Feb. 5	0.4	79.3	0.2	184	0.3	223	0.5	536
10	0.4	80.0	0.2	185	0.3	225	0.5	540
15	0.4	80.6	0.1	187	0.4	226	0.5	544
20	-0.4	81.2	+0.1	188	-0.4	228	+0.5	548
25	0.5	81.7	0.1	189	0.4	229	0.4	552
Mar. 2	0.5	82.2	+0.1	191	0.4	231	0.4	555
7	0.5	82.6	0.0	192	0.4	232	0.4	558
12	0.6	83.0	0.0	192	0.4	233	0.3	561
17	-0.6	83.4	0.0	193	-0.5	234	+0.3	563
22	0.6	83.6	0.0	194	0.5	235	0.2	565
27	0.7	83.8	-0.1	194	0.6	235	0.2	566
Apr. 1	0.7	83.9	0.1	195	0.6	236	0.1	567
6	0.7	84.0	0.2	195	0.6	236	+0.1	567
11	-0.8	84.0	-0.2	195	-0.7	236	0.0	567
16	0.8	83.9	0.2	194	0.7	236	0.0	566
21	0.8	83.7	0.3	194	0.7	235	-0.1	565
26	0.9	83.4	0.3	193	0.8	234	0.2	564
May 1	0.9	83.1	0.3	193	0.8	233	0.2	562
6	-1.0	82.7	-0.4	192	-0.8	232	-0.2	559
11	1.0	82.3	0.4	191	0.8	231	0.3	556
16	1.0	81.8	0.4	190	0.9	230	0.3	553
21	1.0	81.3	0.4	189	0.9	228	0.4	549
26	1.0	80.8	0.5	187	0.9	227	0.4	546
31	-1.1	80.2	-0.5	186	-0.9	225	-0.4	542
June 5	1.1	79.6	0.5	184	0.9	223	0.4	537
10	1.1	78.9	0.5	183	0.9	222	0.4	533
15	1.1	78.3	0.5	181	0.9	220	0.4	529
20	1.1	77.6	0.5	180	0.9	218	0.4	524
25	-1.1	76.9	-0.5	178	-0.9	216	-0.4	520
30	1.1	76.3	0.5	177	0.9	214	0.4	515
July 5	1.1	75.6	0.5	175	0.9	212	0.4	511
10	1.0	75.0	0.5	174	0.9	211	0.4	506
15	1.0	74.3	0.4	172	0.9	209	0.4	502
20	-1.0	73.7	-0.4	171	-0.9	207	-0.3	498
25	-1.0	73.1	-0.4	169	-0.8	205	-0.3	494
..
Dec. 22	+0.7	71.4	+1.2	165	+0.7	200	+1.8	482
27	0.8	71.9	1.2	167	0.7	202	1.8	486
32	+0.8	72.5	+1.3	168	+0.7	204	+1.8	490

Uranus is in opposition September 8, 1923, but at this date the Earth is very near the plane of the orbits of the satellites, and hence the apparent orbits approximate straight lines. For this reason the diagram of the apparent orbits is not given.

GREENWICH MEAN TIME OF GREATEST ELONGATION.

ARIEL.		UMBRIEL.		TITANIA.		OBERON.
North.	South.	North.	South.	North.	South.	North and South.
d h	d h	d h	d h	d h	d h	d h
June 4 17.8	June 8 12.6	May 30 3.6	June 1 5.3	May 19 22.9	May 24 7.4	June 14 19.7 N.
12 7.3	16 2.0	June 7 10.5	9 12.2	28 15.8	June 2 0.3	21 13.3 S.
19 20.7	23 15.4	15 17.4	17 19.1	June 6 8.7	10 17.2	28 6.8 N.
27 10.2	July 1 4.9	24 0.3	26 2.0	15 1.6	19 10.1	July 5 0.4 S.
July 4 23.6	8 18.4	July 2 7.2	July 4 8.9	23 18.6	28 3.0	11 17.9 N.
12 13.1	16 7.8	10 14.1	12 15.8	July 2 11.5	July 6 20.0	18 11.5 S.
20 2.5	23 21.3	18 21.0	20 22.7	11 4.4	15 12.9	25 5.1 N.
27 16.0	31 10.7	27 3.9	29 5.6	19 21.4	24 5.8	31 22.6 S.
Aug. 4 5.5	Aug. 8 0.2	Aug. 4 10.8	Aug. 6 12.6	28 14.3	Aug. 1 22.8	Aug. 7 16.2 N.
11 18.9	15 13.7	12 17.8	14 19.5	Aug. 6 7.2	10 15.7	14 9.8 S.
19 8.4	23 3.1	21 0.7	23 2.4	15 0.2	19 8.7	21 3.4 N.
26 21.9	30 16.6	29 7.6	31 9.3	23 17.2	28 1.6	27 21.0 S.
Sept. 3 11.3	Sept. 7 6.1	Sept. 6 14.5	Sept. 8 16.3	Sept. 1 10.1	Sept. 5 18.6	Sept. 3 14.6 N.
11 0.8	14 19.5	14 21.5	16 23.2	10 3.1	14 11.6	10 8.2 S.
18 14.3	22 9.0	23 4.4	25 6.1	18 20.1	23 4.5	17 1.8 N.
26 3.8	29 22.5	Oct. 1 11.4	Oct. 3 13.1	27 13.0	Oct. 1 21.5	23 19.3 S.
Oct. 3 17.2	Oct. 7 12.0	9 18.3	11 20.0	Oct. 6 6.0	10 14.5	30 12.9 N.
11 6.7	15 1.5	18 1.2	20 3.0	14 23.0	19 7.5	Oct. 7 6.5 S.
18 20.2	22 15.0	26 8.2	28 9.9	23 15.9	28 0.4	14 0.1 N.
26 9.7	30 4.4	Nov. 3 15.1	Nov. 5 16.8	Nov. 1 8.9	Nov. 5 17.4	20 17.7 S.
Nov. 2 23.2	Nov. 6 17.9	11 22.1	13 23.8	10 1.9	14 10.4	27 11.3 N.
10 12.7	14 7.4	20 5.0	22 6.7	18 18.8	23 3.3	Nov. 3 4.9 S.
18 2.1	21 20.9	28 11.9	30 13.7	27 11.8	Dec. 1 20.3	9 22.5 N.
25 15.6	29 10.4	Dec. 6 18.9	Dec. 8 20.6	Dec. 6 4.8	10 13.2	16 16.0 S.
Dec. 3 5.1	Dec. 6 23.8	15 1.8	17 3.5	14 21.7	19 6.2	23 9.6 N.

For Ariel every third greatest elongation is given, and for Umbriel every alternate one; the intermediate ones may be found by adding multiples of the period of the satellite.

Sidereal period of Ariel, 2^d 12^h.489; of Umbriel, 4^d 3^h.460; of Titania, 8^d 16^h.941; of Oberon, 13^d 11^h.118.

Time from Northern Elongation.		Ariel.		Umbriel.		Time from Northern Elongation.		Titania.		Time from Northern Elongation.		Oberon.	
		p^1	F	p^1	F			p^1	F			p^1	F
d	h	°		°		d	h	°		d	h	°	
0	0	345.0	1.000	345.0	1.000	0	0	345.0	1.000	0	0	345.0	1.000
0	2	345.2	0.978	345.1	0.992	0	5	345.2	0.989	0	8	345.2	0.988
0	4	345.5	0.915	345.3	0.968	0	10	345.3	0.955	0	16	345.3	0.952
0	6	345.7	0.812	345.4	0.929	0	15	345.5	0.900	1	0	345.5	0.893
0	8	346.1	0.674	345.6	0.875	0	20	345.7	0.825	1	8	345.7	0.813
0	10	346.7	0.508	345.8	0.807	1	1	346.0	0.731	1	16	346.0	0.713
0	12	348.1	0.320	346.0	0.727	1	6	346.3	0.620	2	0	346.4	0.596
0	14	353.7	0.119	346.3	0.634	1	11	346.8	0.496	2	8	347.0	0.464
0	16	153.9	0.093	346.6	0.532	1	16	347.7	0.360	2	16	348.0	0.321
0	18	161.7	0.295	347.2	0.421	1	21	349.6	0.217	3	0	351.0	0.172
0	20	163.1	0.486	348.2	0.304	2	2	0.0	0.071	3	8	34.8	0.024
0	22	163.8	0.655	350.6	0.182	2	7	152.8	0.086	3	16	157.7	0.142
1	0	164.2	0.797	3.2	0.057	2	12	160.7	0.233	4	0	161.6	0.292
1	2	164.5	0.904	150.9	0.074	2	17	162.4	0.375	4	8	162.9	0.437
1	4	164.8	0.973	159.9	0.198	2	22	163.3	0.510	4	16	163.5	0.571
1	6	165.0	1.000	161.9	0.320	3	3	163.7	0.633	5	0	163.9	0.691
1	8	165.2	0.983	162.9	0.436	3	8	164.1	0.741	5	8	164.2	0.794
1	10	165.4	0.925	163.4	0.546	3	13	164.3	0.834	5	16	164.4	0.879
1	12	165.7	0.827	163.8	0.647	3	18	164.5	0.907	6	0	164.6	0.942
1	14	166.1	0.693	164.1	0.738	3	23	164.7	0.960	6	8	164.8	0.983
1	16	166.7	0.529	164.3	0.817	4	4	164.9	0.991	6	16	165.0	1.000
1	18	167.8	0.343	164.5	0.883	4	9	165.0	1.000	7	0	165.1	0.992
1	20	172.2	0.143	164.6	0.935	4	14	165.2	0.986	7	8	165.3	0.961
1	22	329.7	0.068	164.8	0.972	4	19	165.3	0.950	7	16	165.5	0.906
2	0	341.3	0.271	164.9	0.994	5	0	165.5	0.893	8	0	165.7	0.830
2	2	343.0	0.463	165.0	1.000	5	5	165.7	0.816	8	8	166.0	0.734
2	4	343.7	0.636	165.1	0.990	5	10	166.0	0.720	8	16	166.3	0.619
2	6	344.2	0.781	165.3	0.964	5	15	166.3	0.607	9	0	166.8	0.491
2	8	344.5	0.893	165.4	0.923	5	20	166.9	0.482	9	8	167.8	0.350
2	10	344.7	0.967	165.6	0.867	6	1	167.8	0.345	9	16	170.0	0.200
2	12	344.9	0.999	165.8	0.797	6	6	170.0	0.202	10	0	186.5	0.049
2	14	345.2	0.988	166.0	0.715	6	11	184.3	0.054	10	8	335.7	0.111
2	16			166.3	0.621	6	16	334.8	0.100	10	16	341.2	0.263
2	18			166.7	0.517	6	21	341.0	0.248	11	0	342.7	0.409
2	20			167.3	0.405	7	2	342.6	0.390	11	8	343.4	0.546
2	22			168.4	0.287	7	7	343.3	0.523	11	16	343.9	0.669
3	0			171.2	0.165	7	12	343.8	0.645	12	0	344.2	0.776
3	2			190.4	0.043	7	17	344.1	0.752	12	8	344.4	0.864
3	4			333.6	0.091	7	22	344.3	0.842	12	16	344.6	0.932
3	6			340.3	0.214	8	3	344.5	0.913	13	0	344.8	0.977
3	8			342.1	0.335	8	8	344.7	0.964	13	8	344.9	0.998
3	10			343.0	0.451	8	13	344.9	0.993	13	16	345.1	0.996
3	12			343.5	0.560	8	18	345.0	1.000				
3	14			343.8	0.660								
3	16			344.1	0.749								
3	18			344.3	0.827								
3	20			344.5	0.891								
3	22			344.6	0.941								
4	0			344.8	0.976								
4	2			344.9	0.996								
4	4			345.0	0.999								

Position angle of satellite $p = p^1 + (P - P_0)$.Apparent distance of satellite $s = F \frac{a(p)}{p}$.

SATELLITES OF URANUS, 1923.

FOR GREENWICH MEAN MIDNIGHT.

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
	°	"	"	"	"		°	"	"	"	"
May 10	0.0	12.9	17.9	29.4	39.4	Sept. 7	+0.1	13.9	19.3	31.7	42.4
15	0.0	12.9	18.0	29.5	39.5	12	0.2	13.9	19.3	31.7	42.3
20	0.0	13.0	18.1	29.7	39.7	17	0.2	13.8	19.3	31.6	42.3
25	0.0	13.0	18.1	29.8	39.8	22	0.2	13.8	19.3	31.6	42.3
30	0.0	13.1	18.2	29.9	40.0	27	0.2	13.8	19.2	31.6	42.2
June 4	0.0	13.1	18.3	30.0	40.1	Oct. 2	+0.2	13.8	19.2	31.5	42.2
9	0.0	13.2	18.4	30.1	40.3	7	0.3	13.8	19.2	31.5	42.1
14	0.0	13.3	18.4	30.3	40.5	12	0.3	13.7	19.1	31.4	42.0
19	-0.1	13.3	18.5	30.4	40.6	17	0.3	13.7	19.1	31.3	41.9
24	0.1	13.4	18.6	30.5	40.8	22	0.3	13.6	19.0	31.2	41.7
29	-0.1	13.4	18.7	30.6	41.0	27	+0.3	13.6	19.0	31.1	41.6
July 4	0.0	13.5	18.8	30.8	41.1	Nov. 1	0.3	13.6	18.9	31.0	41.4
9	0.0	13.5	18.8	30.9	41.3	6	0.3	13.5	18.8	30.9	41.3
14	0.0	13.6	18.9	31.0	41.4	11	0.4	13.5	18.7	30.8	41.1
19	0.0	13.6	19.0	31.1	41.6	16	0.4	13.4	18.7	30.6	41.0
24	0.0	13.6	19.0	31.2	41.7	21	+0.4	13.3	18.6	30.5	40.8
29	0.0	13.7	19.1	31.3	41.8	26	0.4	13.3	18.5	30.4	40.6
Aug. 3	0.0	13.7	19.1	31.4	42.0	Dec. 1	0.4	13.2	18.4	30.2	40.4
8	0.0	13.8	19.2	31.4	42.1	6	0.4	13.2	18.4	30.1	40.3
13	0.0	13.8	19.2	31.5	42.2	11	0.4	13.1	18.3	30.0	40.1
18	+0.1	13.8	19.2	31.6	42.2	16	+0.3	13.1	18.2	29.9	39.9
23	0.1	13.8	19.3	31.6	42.3	21	0.3	13.0	18.1	29.7	39.8
28	0.1	13.8	19.3	31.6	42.3	26	0.3	13.0	18.0	29.6	39.6
Sept. 2	+0.1	13.9	19.3	31.7	42.3	31	+0.3	12.9	18.0	29.5	39.4

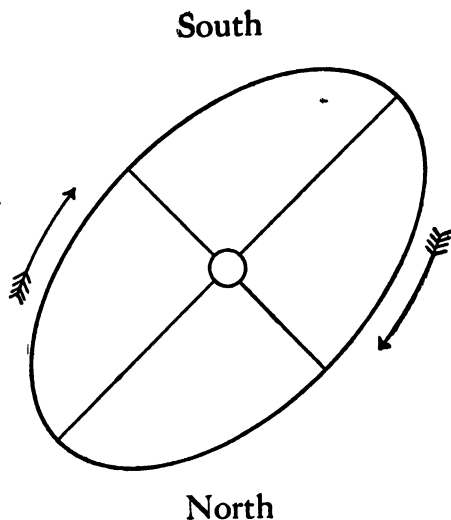
SATELLITE OF NEPTUNE, 1923.

Time from Eastern Elongation.			p^1	F	Time from Eastern Elongation.			p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d	h	°			d	h	°								
0	0	134.0	1.000		3	0	311.8	0.999		Jan. 1	+0.3	16.7	May 1	-1.8	16.3
0	3	129.6	0.994		3	3	307.3	0.987		6	0.2	16.7	6	1.8	16.2
0	6	125.0	0.977		3	6	302.7	0.964		11	+0.1	16.7	11	1.8	16.2
0	9	120.2	0.948		3	9	297.7	0.930		16	0.0	16.7	16	1.7	16.1
0	12	115.1	0.910		3	12	292.4	0.888		21	-0.1	16.7	21	1.7	16.1
0	15	109.5	0.863		3	15	286.4	0.838		26	-0.2	16.8	26	-1.6	16.0
0	18	103.1	0.810		3	18	279.7	0.783		31	0.4	16.8	..	..	..
0	21	95.9	0.754		3	21	271.9	0.727		Feb. 5	0.5	16.8	Oct. 13	+2.3	16.0
1	0	87.5	0.699		4	0	262.8	0.673		10	0.6	16.8	18	2.4	16.0
1	3	77.7	0.649		4	3	252.3	0.627		15	0.7	16.8	23	2.4	16.0
1	6	66.4	0.609		4	6	240.4	0.594		20	-0.9	16.7	28	+2.5	16.1
1	9	53.9	0.584		4	9	227.5	0.579		25	1.0	16.7	Nov. 2	2.6	16.1
1	12	40.7	0.579		4	12	214.3	0.584		Mar. 2	1.1	16.7	7	2.6	16.2
1	15	27.8	0.594		4	15	201.8	0.608		7	1.2	16.7	12	2.6	16.2
1	18	15.8	0.627		4	18	190.5	0.648		12	1.3	16.7	17	2.6	16.3
1	21	5.3	0.673		4	21	180.7	0.698		17	-1.4	16.6	22	+2.7	16.3
2	0	356.2	0.726		5	0	172.2	0.753		22	1.5	16.6	27	2.6	16.4
2	3	348.4	0.782		5	3	165.0	0.809		27	1.6	16.6	Dec. 2	2.6	16.4
2	6	341.6	0.837		5	6	158.6	0.862		Apr. 1	1.6	16.5	7	2.6	16.4
2	9	335.7	0.887		5	9	153.0	0.909		6	1.7	16.5	12	2.6	16.5
2	12	330.3	0.930		5	12	147.8	0.947		11	-1.8	16.5	17	+2.5	16.5
2	15	325.4	0.963		5	15	143.1	0.976		16	1.8	16.4	22	2.5	16.6
2	18	320.7	0.986		5	18	138.5	0.994		21	1.8	16.4	27	2.4	16.6
2	21	316.2	0.998		5	21	134.1	1.000		26	-1.8	16.3	32	+2.3	16.6

Position angle of satellite $p=p^1+(P-P_0)$.

Apparent distance of satellite $s=F\frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION,
FEBRUARY 6, 1923, AS SEEN IN AN INVERTING TELESCOPE



GREENWICH MEAN TIME OF GREATEST ELONGATION.

Jan.	d h	E.	Mar.	d h	W.	May	d h	E.	July	d h	W.	Nov.	d h	E.
	2	19.7		5	13.4		6	6.7		6	23.3		4	9.0
	5	18.2		8	11.9		9	5.2		9	21.8		7	7.5
	8	16.8		11	10.5		12	3.8		12	12.3		10	6.0
	11	15.3		14	9.0		15	2.3		15	10.7		13	4.6
	14	13.9		17	7.6		18	0.8		18	9.2		16	3.1
	17	12.4		20	6.1		20	23.3		21	7.7		19	1.6
	20	11.0		23	4.7		23	21.8		24	6.2		22	0.1
	23	9.5		26	3.2		26	20.3		27	4.7		24	22.6
	26	8.1		29	1.8		29	18.8		30	3.1		27	21.1
	29	6.7	Apr.	1	0.3	June	1	17.4					30	19.6
Feb.	1	5.2		3	22.9		4	15.8	Oct.	3	1.6	Dec.	3	18.2
	4	3.8		6	21.4		7	14.4		6	0.1		6	16.7
	7	2.3		9	19.9		10	12.8		8	22.6		9	15.2
	10	0.9		12	18.5		13	11.3		11	21.1		12	13.7
	12	23.4		15	17.0		16	9.8		14	19.6		15	12.3
	15	22.0		18	15.6		19	8.3		17	18.1		18	10.8
	18	20.6		21	14.1		22	6.8		20	16.6		21	9.4
	21	19.1		24	12.6		25	5.3		23	15.0		24	7.9
	24	17.7		27	11.2		28	3.8		26	13.5		27	6.4
	27	16.2		30	9.7	July	1	2.3		29	12.0		30	5.0
Mar.	2	14.8	May	3	8.2		4	0.8	Nov.	1	10.5		33	3.5

In the above diagram the central circle represents the planet.

The sidereal period of the satellite of Neptune is $5^d 21^h.044$.

PHENOMENA, 1923.

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

[illegible]

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

July	d h m			° ' "	
	d	h	m		
	6	8	-	□ ♃ ☉	Stationary.
	7	8	-	♃	in ♄
	10	9	-	♃	in ♄
	12	4	30	♂ ♀ ☾	♂ + 4 37
	12	16	8	♂ ♀ ☾	♂ + 5 0
	14	6	8	♂ ☾ ☾	♂ + 4 40
	15	0	-	♂	in Perihelion.
	15	13	31	♂ ☾ ☾	♂ + 2 28
	16	0	-	♂	in ♄
	19	15	15	♂ ♃ ☾	♂ - 0 18
	21	8	9	♂ ♃ ☾	♂ - 3 24
	21	22	-	♂ ☾ ☾	Superior.
	25	7	-	♂	Greatest Hel. Lat. N.
	25	14	-	♂ ☾ ☾	♂ + 0 39
	30	19	2	♂ ☾ ☾	♂ - 0 21
Aug.	30	23	-	♂ ☾ ☾	♂ + 1 35
	3	1	-	□ ♃ ☉	Stationary.
	8	8	-	♂ ☾ ☾	♂ + 0 39
	11	3	-	♂ ☾ ☾	♂ + 0 39
	11	10	4	♂ ♀ ☾	♂ + 3 46
	11	23	1	♂ ☾ ☾	♂ + 3 22
	11	23	12	♂ ☾ ☾	♂ + 2 22
	12	3	-	♂ ☾ ☾	♂ + 0 59
	13	13	27	♂ ☾ ☾	♂ + 0 39
	16	0	8	♂ ♃ ☾	♂ - 0 41
Sept.	16	18	-	♂	Greatest Hel. Lat. N.
	17	16	-	♂ ♀ ☾	♂ + 0 58
	17	17	6	♂ ♃ ☾	♂ - 3 45
	17	18	-	♂	in ♄
	18	12	-	♂	in Perihelion.
	23	4	-	♂ ☾ ☾	♂ + 0 6
	25	-	-	☾	Par. ecl. vis. at Wash.
	27	1	24	♂ ☾ ☾	♂ - 0 24
	28	0	-	♂	in Aphelion.
	2	10	-	♂	Greatest elong. E. 27 9
Sept.	8	10	34	♂ ☾ ☾	♂ + 2 18
	8	19	-	♂ ☾ ☾	♂ + 0 58
	9	12	-	♂	Greatest Hel. Lat. N.
	9	15	6	♂ ☾ ☾	♂ + 1 44
	9	23	-	♂ ♀ ☾	Superior.
	10	-	-	☉	Tot. ecl. vis. as par. at W.
	10	9	44	♂ ♀ ☾	♂ + 0 56
	11	23	1	♂ ☾ ☾	♂ - 6 44
	12	12	17	♂ ♃ ☾	♂ - 0 59
	14	6	9	♂ ♃ ☾	♂ - 4 1
Sept.	15	14	-	♂	Stationary.
	17	8	-	♂	Greatest Hel. Lat. S.
	21	17	-	♂	in Aphelion.
	23	6	22	♂ ☾ ☾	♂ - 0 31
	23	14	4	☉	enters ♈, Autumn com.
Sept.	25	17	-	♂ ♀ ☾	♂ - 4 57
	28	16	-	♂ ☾ ☾	Inferior.
	5	22	5	♂ ☾ ☾	♂ + 2 11
	6	9	-	♂	in ♄
	7	0	-	♂	Stationary.
	8	6	49	♂ ☾ ☾	♂ - 0 3
	8	14	6	♂ ☾ ☾	♂ - 1 0
	8	18	-	♂ ☾ ☾	♂ - 1 22
	10	3	24	♂ ♃ ☾	♂ - 1 13
	10	6	2	♂ ♀ ☾	♂ - 2 45
Sept.	11	0	-	♂	in Perihelion.
	11	23	24	♂ ♃ ☾	♂ - 4 11
	14	4	-	♂	Greatest elong. W. 18 7
	15	-	-	♂	Greatest Hel. Lat. N.
	16	23	-	♂ ☾ ☾	♂ - 0 31
	20	10	31	♂ ☾ ☾	♂ - 0 31
	21	6	-	♂	Greatest Hel. Lat. N.
	29	12	-	♂ ☾ ☾	♂ - 0 42
	2	7	47	♂ ☾ ☾	♂ + 1 58
	4	8	-	♂ ♀ ☾	♂ - 0 45
Nov.	4	14	-	♂	in ♄
	5	22	17	♂ ☾ ☾	♂ - 1 49
	6	19	47	♂ ♃ ☾	♂ - 1 27
	7	17	31	♂ ☾ ☾	♂ - 3 53
	8	19	42	♂ ♃ ☾	♂ - 4 18
	9	3	45	♂ ♀ ☾	♂ - 5 17
	13	7	-	☉	Stationary.
	13	17	-	♂	in ♄
	15	12	-	♂ ☾ ☾	Superior.
	16	15	22	♂ ☾ ☾	♂ - 0 21
Nov.	19	18	-	♂ ☾ ☾	♂ - 1 25
	22	10	-	♂ ♃ ☾	♂ - 0 24
	23	9	-	♂	Stationary.
	23	20	-	♂	Stationary.
	23	23	-	♂	in Aphelion.
	29	14	34	♂ ☾ ☾	♂ + 1 41
	1	20	-	♂ ☾ ☾	♂ - 1 30
	4	11	0	♂ ♃ ☾	♂ - 1 43
	4	13	22	♂ ☾ ☾	♂ - 3 19
	6	9	-	☉	Stationary.
Dec.	6	16	59	♂ ♃ ☾	♂ - 4 23
	8	10	45	♂ ☾ ☾	♂ - 6 47
	8	20	-	♂	in Aphelion.
	9	5	14	♂ ♀ ☾	♂ - 5 30
	13	22	38	♂ ☾ ☾	♂ - 0 1
	14	8	-	♂	Greatest Hel. Lat. S.
	22	8	54	☉	enters ♏, Winter com.
	26	19	22	♂ ☾ ☾	♂ + 1 29
	27	4	-	♂	Greatest elong. E. 19 46
	31	10	-	♂	Greatest Hel. Lat. S.
Dec.	31	22	47	♂ ♃ ☾	♂ - 1 59

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
1	Abbadia, France . . .	+43 22 52.2	-11 34.4	69	9.999317	+ 0 7 0.1	+ 1.15
2	Adelaide, S. Australia .	-34 55 38.0 ^a	+10 52.4	41 ^b	9.999526	- 9 14 20.07 ^a	- 91.06
3	Adelaide, S. Australia .	-34 55 37.4 ^c	+10 52.4	. . .	9.999523	- 9 14 20.17 ^c	- 91.06
4	Albany, N. Y. . . .	+42 39 12.7 ^a	-11 33.1	70 ^a	9.999336	+ 4 55 7.12 ^a	+ 48.48
5	Albany, N. Y. . . .	+42 39 49.5 ^a	-11 33.1	52	9.999335	+ 4 54 59.97 ^a	+ 48.46
6	Algiers, Algeria . . .	+36 47 50	-11 6.7	342	9.999501	- 0 12 8.38	- 1.99
7	Allegheny, Pa. . . .	+40 28 58.1 ^d	-11 26.7	370 ^d	9.999411	+ 5 20 5.39 ^d	+ 52.58
8	Allegheny, Pa. . . .	+40 27 41.6	-11 26.6	. . .	9.999387	+ 5 20 2.93	+ 52.58
9	Amherst, Mass. . . .	+42 21 56.5 ^e	-11 32.5	110 ^e	9.999346	+ 4 50 5.93 ^e	+ 47.66
10	Amherst, Mass. . . .	+42 22 17.1 ^f	-11 32.5	. . .	9.999338	+ 4 50 4.67 ^f	+ 47.65
11	Ann Arbor, Mich. . . .	+42 16 48.7 ^a	-11 32.3	282 ^a	9.999360	+ 5 34 55.27 ^a	+ 55.02
12	Appleton, Wis. . . .	+44 15 39.2 ^g	-11 35.4	242	9.999307	+ 5 53 35.92 ^g	+ 58.09
13	Arcetri, Italy	+43 45 14.4	-11 34.9	184	9.999316	- 0 45 1.30	- 7.40
14	Arequipa, Peru	-16 22 28.0 ^h	+ 6 15.2	2451 ^h	0.000052	+ 4 46 11.73 ^h	+ 47.02
15	Armagh, Ireland . . .	+54 21 12.7 ^c	-10 59.6	61 ^c	9.999040	+ 0 26 35.4 ^c	+ 4.37
16	Athens, Greece	+37 58 19.7 ⁱ	-11 14.3	107 ⁱ	9.999456	- 1 34 53 ⁱ	- 15.59
17	Baltimore, Md. . . .	+39 17 52.0 ^j	-11 21.5	36 ^j	9.999418	+ 5 6 29.1 ^j	+ 50.35
18	Bamberg, Bavaria . . .	+49 53 6.0 ^c	-11 26.0	299 ^c	9.999167	- 0 43 33.57 ^c	- 7.16
19	Barcelona, Spain . . .	+41 25 18	-11 30.0	420	9.999391	- 0 8 28.0	- 1.39
20	Beloit, Wis.	+42 30 8.4	-11 32.8	. . .	9.999335	+ 5 56 7.4	+ 58.50
21	Bergedorf, Germany . .	+53 28 46.2	-11 6.1	35	9.999060	- 0 40 57.74	- 6.73
22	Berkeley, Cal.	+37 52 23.6	-11 13.7	97	9.999458	+ 8 9 2.82	+ 80.34
23	Berlin-Babelsberg., Pr.	+52 24 24.2 ^e	-11 13.1	82 ^e	9.999089	- 0 52 25.49 ^e	- 8.61
24	Berlin, Prussia	+52 30 16.7 ^k	-11 12.5	47 ^k	9.999085	- 0 53 34.80 ^k	- 8.80
25	Berlin, Prussia	+52 31 13.1	-11 12.4	. . .	9.999081	- 0 53 34.41	- 8.80
26	Berlin, Prussia	+52 31 30.7	-11 12.4	. . .	9.999081	- 0 53 27.40	- 8.78
27	Berlin, Prussia	+52 29 7	-11 12.6	38	9.999084	- 0 53 54.2	- 8.86
28	Berne, Switzerland . . .	+46 57 8.7	-11 34.2	573	9.999260	- 0 29 45.70 ^a	- 4.89
29	Besançon, France . . .	+47 14 59.0	-11 33.7	312	9.999235	- 0 23 57.13	- 3.93
30	Birr Castle, Ireland . .	+53 5 47	-11 8.7	56	9.999071	+ 0 31 40.9	+ 5.20
31	Bloomington, Ind. . . .	+39 9 56 ^d	-11 20.8	238 ^d	9.999435	+ 5 46 5 ^d	+ 56.85
32	Bogota, Colombia . . .	+ 4 35 55.2 ^c	- 1 50.8	2634	0.000170	+ 4 56 23.5	+ 48.69
33	Bombay (Colaba), India	+18 53 36.2 ^c	- 7 5.1	14 ^c	9.999849	- 4 51 15.72 ^c	- 47.85
34	Bonn, Prussia	+50 43 45.0 ^k	-11 22.3	62 ^l	9.999130	- 0 28 23.17 ^k	- 4.66
35	Bordeaux (Floirac), France	+44 50 7.2 ^a	-11 35.6	73	9.999281	+ 0 2 5.51 ^a	+ 0.34
36	Boston, Mass.	+42 20 58 ^m	-11 32.5	31 ^m	9.999341	+ 4 44 19.1 ^m	+ 46.71
37	Boston, Mass.	+42 21 32.5	-11 32.5	48	9.999342	+ 4 44 15.0	+ 46.70
38	Bothkamp, Prussia . . .	+54 12 9.6 ⁿ	-11 0.8	32 ⁿ	9.999042	- 0 40 31.02 ⁿ	- 6.66
39	Bremen, Germany . . .	+53 4 36	-11 8.8	. . .	9.999067	- 0 35 15	- 5.79
40	Breslau, Prussia	+51 6 55.8 ^k	-11 20.4	147 ^k	9.999126	- 1 8 8.72 ^k	- 11.20
41	Brisbane, Queensland . .	-27 28 0.0	+ 9 28.3	. . .	9.999691	-10 12 6.17	-100.55
42	Brussels (Uccle), Belgium	+50 47 55.5 ^a	-11 21.9	105 ^a	9.999131	- 0 17 26.05 ^a	- 2.86
43	Brussels, Belgium . . .	+50 51 10.6 ^c	-11 21.7	. . .	9.999123	- 0 17 28.02 ^c	- 2.87
44	Budapest, Hungary . . .	+47 29 34.7 ^c	-11 33.2	131 ^c	9.999217	- 1 16 15.3 ^c	- 12.53
45	Cambridge, England . . .	+52 12 51.6	-11 14.3	28	9.999091	- 0 0 22.75	- 0.06
46	Cambridge, Mass	+42 22 47.6 ^o	-11 32.6	24	9.999340	+ 4 44 31.05 ^o	+ 46.74
47	Cape of Good Hope . . .	-33 56 3.5 ^p	+10 43.6	13 ^p	9.999548	- 1 13 54.76 ^p	- 12.14

^a Meridian circle.^b Standard barometer.^c Transit instrument.^d Transit instrument pier.^e Center of large dome.^f Center of dome tower.^g Center of dome.^h Transit pier.ⁱ Cerere Syngros.^j Center of instrument house.^k Center of observatory.^l Floor of meridian room.^m Foot of pillar of 7-in. equatorial.ⁿ Cube of equatorial.^o Dome of 15-in. equatorial.^p 8-in. meridian circle.

No.	Authority for—		Description.
	Latitude.	Longitude.	
1	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs. Paris Acad. of Sci., Hendaye.
2	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., since 1884.
3	Letter from Govt. Astronomer, 1913.	Letter from Govt. Astronomer, 1913.	Govt. Obs., before 1884.
4	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., since 1893.
5	Letter from Director, 1913.	Letter from Director, 1913.	Dudley Obs., before 1893.
6	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	At Bouzaréah. Old Obs. 3° 8 S., 8° E.
7	<i>Publications of Obs.</i> , 1909.	<i>Publications of Obs.</i> , 1909.	^a Obs. Western Univ. of Pa., since 1905.
8	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Western Univ. of Pa., before 1905.
9	Letter from Director, 1913.	Letter from Director, 1913.	Amherst College Obs., since 1903.
10	Letter from Director, 1913.	Letter from Director, 1913.	Lawrence Obs., before 1903.
11	<i>Publications of Obs.</i> , 1915.	<i>Publications of Obs.</i> , 1915.	Detroit Obs., Univ. of Mich.
12	See footnote (b).	See footnote (b).	Underwood Obs., Lawrence College.
13	<i>Pubbl. dell'Osserv.</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
14	<i>Harvard Annals</i> , 1903.	<i>Harvard Annals</i> , 1903.	Branch of Harvard Coll. Obs.
15	<i>Armagh Catalogue of Stars</i> , 1840.	<i>Armagh Catalogue of Stars</i> , 1840.	Armagh Observatory.
16	<i>Annales de l'Obs.</i> , 1910.	Letter from Director, 1913.	^c National Observatory.
17	Letter from Director, 1913.	Letter from Director, 1913.	Johns Hopkins Univ. Obs.
18	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Reiems Observatory.
19	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Fabra Obs., Acad. of Sci. and Arts.
20	Letter from Director, 1897.	Letter from Director, 1897.	Smith Obs., Beloit College.
21	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hamburg Obs., since 1909.
22	Letter from Director, 1897.	See footnote (d).	Students' Obs., Univ. of Cal.
23	See footnote (e).	See footnote (e).	University Obs., since 1913.
24	<i>Astron. Nach.</i> , Nr. 3545, 1898.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Obs., 1835 to 1913.
25	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., before 1835.
26	<i>Astron. Nach.</i> , Nr. 3170, 1893.	<i>Astron. Nach.</i> , Nr. 3170, 1893.	Urania Observatory.
27	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Treptow Observatory.
28	<i>Berliner Jahrbuch</i> .	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Observatory, Cantonal Univ.
29	<i>Astron. Nach.</i> , Nr. 2805, 1887.	<i>Astron. Nach.</i> , Nr. 2805, 1887.	National Observatory.
30	<i>British Nautical Almanac</i> .	<i>British Nautical Almanac</i> .	Private Obs. of Earl of Rosse.
31	Letter from Director, 1913.	Letter from Director, 1913.	Kirkwood Obs., Univ. of Ind.
32	Letter from Director, 1913.	Letter from Director, 1913.	National Observatory.
33	Letter from Director, 1913.	Letter from Director, 1913.	Government Observatory.
34	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
35	Letter from Director, 1897.	<i>Annales de l'Obs.</i> , 1885.	Obs., Univ. of Bordeaux.
36	Letter from Director, 1909.	Letter from Director, 1909.	Boston Univ. Obs., since 1908.
37	Letter from Director, 1895.	Letter from Director, 1895.	Boston Univ. Obs., before 1908.
38	<i>Beob. zu Bothkamp</i> , 1872.	Letter from Director, 1913.	Obs. of Herr von Bülow.
39	<i>Astron. Nach.</i> , Nr. 15, 1822.	<i>Astron. Nach.</i> , Nr. 15, 1822.	Formerly Olber's Obs.
40	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
41	<i>British Nautical Almanac</i> .	<i>f</i> <i>British Nautical Almanac</i> .	Brisbane Observatory.
42	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs., since 1891.
43	<i>Annales de l'Obs.</i> , 1857.	Letter from Director, 1913.	Royal Obs., before 1891.
44	<i>Astron. Nach.</i> , Nr. 2752, 1886.	<i>Astron. Nach.</i> , Nr. 2752, 1886.	University Observatory.
45	Letter from Director, 1879.	Letter from Director, 1879.	University Observatory.
46	<i>Harvard Annals</i> , 1887.	<i>U. S. C. and G. S. Report</i> , 1897.	Harvard College Obs.
47	<i>Cape Gen. Catalogue of Stars</i> , 1885.	<i>Monthly Notices, R. A. S.</i> , Nov. 1908.	Royal Observatory.

^a Name of Western Univ. of Pa. changed in 1908; now the Univ. of Pittsburgh.

^b *Professional Papers, Corps of Engineers, U. S. A.*, 1882.

^c Old meridian circle 0° 4 S., 0° 1 W. of Cercle Syngros.

^d *Publications of the Astronomical Society of the Pacific*, No. 165, 1916.

^e *Veröffentlichungen der Universitätssternwarte zu Berlin-Babelsberg, Band III, Heft I.*

^f With the new value of the longitude of Sydney.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log <i>p</i> (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
48	Carloforte, Sardinia . .	+39 8 8.9 <i>a</i>	-11 20.7	18 <i>a</i>	9.999421	-0 33 14.9 <i>a</i>	- 5.46
49	Catania, Sicily . . .	+37 30 13.2 <i>b</i>	-11 11.4	49 <i>b</i>	9.999464	-1 0 20.70 <i>b</i>	- 9.91
50	Charkow, Russia . . .	+50 0 9.9 <i>c</i>	-11 25.5	138 <i>d</i>	9.999153	-2 24 55.75 <i>c</i>	-23.81
51	Charlottesville, Va. . .	+38 2 1.2 <i>e</i>	-11 14.6	259 <i>e</i>	9.999465	+5 14 5.33 <i>e</i>	+51.60
52	Chicago, Ill.	+41 50 1.0	-11 31.2	. . .	9.999352	+5 50 26.84	+57.57
53	Christiania, Norway . .	+59 54 44.0 <i>c</i>	-10 4.6	25 <i>c</i>	9.998908	-0 42 53.50 <i>c</i>	- 7.05
54	Cincinnati, Ohio . . .	+39 8 19.8 <i>f</i>	-11 20.7	247 <i>f</i>	9.999437	+5 37 41.40 <i>f</i>	+55.48
55	Cincinnati, Ohio . . .	+39 6 26.5	-11 20.5	. . .	9.999421	+5 37 59.00	+55.52
56	Cleveland, Ohio . . .	+41 30 14.5 <i>g</i>	-11 30.2	215 <i>g</i>	9.999375	+5 26 25.86 <i>g</i>	+53.62
57	Clinton, N. Y. . . .	+43 3 17.0	-11 33.9	276	9.999340	+5 1 37.45	+49.55
58	Coimbra, Portugal . .	+40 12 24.5	-11 25.6	99	9.999400	+0 33 43.1	+ 5.54
59	Columbia, Mo.	+38 56 51.7 <i>h</i>	-11 19.7	225 <i>i</i>	9.999440	+6 9 18.33 <i>h</i>	+60.67
60	Columbus, Ohio . . .	+39 59 50.4 <i>h</i>	-11 24.7	233 <i>h</i>	9.999414	+5 32 2.60 <i>h</i>	+54.55
61	Copenhagen, Denmark .	+55 41 12.6	-10 48.6	14	9.999005	-0 50 18.69 <i>j</i>	- 8.26
62	Cordova, Arg. Rep. . .	-31 25 15.5 <i>k</i>	+10 18.0	434 <i>k</i>	9.999634	+4 16 48.22 <i>k</i>	+42.19
63	Cracow, Austria . . .	+50 3 52.0 <i>c</i>	-11 25.2	221 <i>c</i>	9.999157	-1 19 50.27 <i>c</i>	-13.12
64	Danzig, Prussia . . .	+54 21 18.0	-10 59.6	3	9.999036	-1 14 39.6	-12.26
65	Dehra Dun, India . . .	+30 18 51.8 <i>l</i>	-10 5.3	681 <i>l</i>	9.999676	-5 12 11.76 <i>l</i>	-51.29
66	Denver, Colo.	+39 40 36.4 <i>c</i>	-11 23.3	1644 <i>m</i>	9.999518	+6 59 47.72 <i>c</i>	+68.96
67	Des Moines, Iowa . . .	+41 36 0	-11 30.5	296	9.999378	+6 14 30.56	+61.52
68	Dorpat (Jurjew), Russia	+58 22 47.2 <i>c</i>	-10 22.1	67 <i>c</i>	9.998945	-1 46 53.22 <i>c</i>	-17.56
69	Dresden, Saxony . . .	+51 2 16.8	-11 20.8	121	9.999126	-0 54 54.74	- 9.02
70	Dublin, Ireland . . .	+53 23 13.1 <i>c</i>	-11 6.7	86 <i>c</i>	9.999066	+0 25 21.1 <i>c</i>	+ 4.16
71	Dun Echt, Scotland . .	+57 9 36	-10 34.8	141	9.998979	+0 9 40.0	+ 1.59
72	Durham, England . . .	+54 46 6.2 <i>b</i>	-10 56.4	107 <i>n</i>	9.999033	+0 6 19.75 <i>b</i>	+ 1.04
73	Dusseldorf, Prussia . .	+51 12 25.0 <i>o</i>	-11 19.9	46 <i>o</i>	9.999117	-0 27 2.69 <i>o</i>	- 4.44
74	Edinburgh, Scotland . .	+55 55 30.0 <i>c</i>	-10 46.5	134 <i>p</i>	9.999007	+0 12 44.22 <i>c</i>	+ 2.09
75	Edinburgh, Scotland . .	+55 57 23.2 <i>q</i>	-10 46.2	106 <i>r</i>	9.998995	+0 12 43.05 <i>q</i>	+ 2.09
76	Elmira, N. Y.	+42 6 25	-11 31.9	. . .	9.999345	+5 7 13.90	+50.47
77	Evanston, Ill.	+42 3 33.4	-11 31.8	175	9.999358	+5 50 42.3	+57.61
78	Flagstaff, Ariz.	+35 12 30.5	-10 54.7	2210	9.999667	+7 26 44.58	+73.39
79	Gaithersburg, Md. . . .	+39 8 13.2 <i>a</i>	-11 20.7	165	9.999431	+5 8 47.73	+50.73
80	Geneva, N. Y.	+42 52 46.2	-11 33.6	152	9.999336	+5 8 1.00	+50.60
81	Geneva, Switzerland . .	+46 11 59.3 <i>c</i>	-11 35.2	407 <i>c</i>	9.999268	-0 24 36.61 <i>c</i>	- 4.04
82	Genoa, Italy	+44 25 9.3 <i>c</i>	-11 35.5	105	9.999293	-0 35 41.28 <i>c</i>	- 5.86
83	Georgetown, D. C. . . .	+38 54 26.7 <i>f</i>	-11 19.5	47	9.999429	+5 8 18.26 <i>f</i>	+50.65
84	Glasgow, Mo.	+39 13 45.6	-11 21.1	227	9.999433	+6 11 18.08	+61.00
85	Glasgow, Scotland . . .	+55 52 42.8 <i>c</i>	-10 46.9	55 <i>s</i>	9.999003	+0 17 10.55 <i>c</i>	+ 2.82
86	Gotha, Germany	+50 56 37.9 <i>o</i>	-11 21.2	322 <i>c</i>	9.999142	-0 42 50.51 <i>o</i>	- 7.04
87	Gotha, Germany	+50 56 4.4 <i>b</i>	-11 21.2	360 <i>b</i>	9.999145	-0 42 55.09 <i>b</i>	- 7.05
88	Göttingen, Prussia . . .	+51 31 48.1 <i>t</i>	-11 18.2	161 <i>t</i>	9.999116	-0 39 46.22 <i>t</i>	- 6.53
89	Greencastle, Ind.	+39 38 46.6 <i>c</i>	-11 23.1	262 <i>c</i>	9.999425	+5 47 24.36 <i>c</i>	+57.07
90	Greenwich, England . .	+51 28 38.2 <i>c</i>	-11 18.5	49 <i>c</i>	9.999110	0 0 0.00 <i>c</i>	0.00
91	Hamburg, Germany . . .	+53 33 6.0	-11 5.6	25	9.999057	-0 39 53.60 <i>c</i>	- 6.55
92	Hamburg, Germany . . .	+53 32 51.3 <i>h</i>	-11 5.6	30 <i>h</i>	9.999058	-0 39 53.46 <i>h</i>	- 6.55
93	Hanover, N. H.	+43 42 15.3	-11 34.8	183	9.999317	+4 49 8.02	+47.50

a Zenith telescope.*b* Transit instrument.*c* Meridian circle.*d* Barometer in meridian room.*e* Center of large dome.*f* Center of dome.*g* Zenith telescope pier.*h* Transit pier.*i* Observatory bench mark.*j* Center of observatory.*k* Old meridian circle.*l* Floor level of zenith sector pillar.*m* Main floor.*n* Barometer in transit room.*o* Equatorial.*p* Standard barometer.*q* Point midway between transit instrument and mural circle.*r* Floor of main building.*s* Floor of meridian circle room.*t* Position of meridian circle before 1888.

No.	Authority for—		Description.
	Latitude.	Longitude.	
48	See footnote (a).	Letter from Director, 1913.	International Lat. Obs.
49	Letter from Director, 1913.	Letter from Director, 1913.	Royal Obs. of Catania and Etna.
50	<i>Annales de l'Obs.</i> , 1904.	<i>Annales de l'Obs.</i> , 1904.	University Observatory.
51	Letter from Director, 1913.	Letter from Director, 1913.	Leander McCormick Obs., Univ. Va.
52	U. S. Lake Survey, 1864.	Smithsonian Report, 1886.	^b Dearborn Observatory.
53	<i>Astron. Nach.</i> , Nr. 3193, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
54	<i>Publications of the Obs.</i> , 1908.	<i>Astronomical Journal</i> , 1897.	Cincinnati Obs., since 1873.
55	Letter from Director, 1897.	<i>Astronomical Journal</i> , 1854.	Cincinnati Obs., before 1873.
56	Letter from Director, 1913.	Letter from Director, 1913.	Case Obs., Case School of Appl'd Sci.
57	<i>Astron. Nach.</i> , Nr. 2553, 1883.	<i>Astron. Nach.</i> , Nr. 2553, 1883.	Litchfield Obs., Hamilton College.
58	<i>Eph. Astron. de Coimbra</i> , 1889.	<i>Eph. Astron. de Coimbra</i> , 1889.	University Observatory.
59	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	<i>Trans. Acad. of Sci. of St. Louis</i> , 1894.	Laws Obs., Univ. of Mo.
60	Letter from Director, 1913.	Letter from Director, 1899.	McMillin Obs., State Univ.
61	British Nautical Almanac.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
62	<i>Resultados del Obs.</i> , 1887.	<i>Resultados del Obs.</i> , 1887.	National Observatory.
63	Letter from Director, 1913.	Letter from Director, 1913.	Imperial and Royal Obs.
64	Letter from Director, 1897.	Letter from Director, 1897.	Obs. of the School of Navigation.
65	<i>Great Trig. Survey of India</i> , 1906.	Letter from Supt. of Survey, 1913.	Haig Obs., Trig. Survey of India.
66	Letter from Director, 1913.	Letter from Director, 1913.	Chamberlin Obs., Univ. of Denver.
67	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Drake Univ. Obs.
68	<i>Publikationen der Sternw.</i> , 1911.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
69	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	^c Baron Engelhardt's Obs.
70	<i>Trans. Royal Dublin Soc.</i> , 1889.	<i>Trans. Royal Irish Acad.</i> , 1838.	Dunsink Obs., Trinity College.
71	Letter from Royal Astronomer, 1897.	Letter from Royal Astronomer, 1897.	^d Lord Crawford's Obs.
72	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
73	<i>Astron. Nach.</i> , Nr. 643, 1848.	Letter from Director, 1913.	Municipal Obs., Bilk.
74	<i>Monthly Notices, R. A. S.</i> , 1907.	Letter from Director, 1913.	Royal Obs. since 1895; Blackford Hill.
75	<i>Monthly Notices, R. A. S.</i> , 1836.	<i>Edinburgh Observations</i> , 1858.	^e Royal Obs. before 1895; Calton Hill.
76	Letter from Director, 1912.	Letter from Director, 1912.	Elmira College Obs.
77	Letter from Director, 1893.	Letter from Director, 1893.	Dearborn Obs., North Western Univ.
78	British Nautical Almanac.	British Nautical Almanac.	Lowell Observatory.
79	See footnote (a).	See footnote (f).	International Lat. Obs.
80	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Smith Observatory.
81	<i>Memoire par J. Pidoux</i> , 1900.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Municipal Observatory.
82	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Hydrographic Institute.
83	See footnote (g).	See footnote (g).	Georgetown College Obs.
84	<i>Astron. Nach.</i> , Nr. 2625, 1884.	<i>Washington Observations</i> , 1877.	Morrison Observatory.
85	<i>First Glasgow Catalogue</i> , 1870.	<i>Monthly Notices, R. A. S.</i> , 1865.	University Observatory.
86	Letter from Director, 1913.	Letter from Director, 1913.	Ducal Obs. since 1857.
87	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Ducal Obs. before 1857.
88	<i>Astron. Nach.</i> , Nr. 4428, 1910.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
89	Letter from Director, 1912.	Letter from Director, 1912.	McKim Obs., De Pauw Univ.
90	<i>Greenwich Observations</i> , 1910.	<i>Greenwich Observations</i> , 1910.	^h Royal Observatory.
91	Letter, Director new Obs., 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	ⁱ Hamburg Observatory before 1909.
92	Letter from Director, 1913.	Letter from Director, 1913.	^j Imperial Marine Obs.
93	Letter from Director, 1894.	Letter from Director, 1894.	Shattuck Obs., Dartmouth College.

^a *Resultate des Internationalen Breitendienstes*, 1900-1908.

^b Transferred to Evanston, Ill., in 1887.

^c Instruments transferred to Univ. of Kasan in 1897.

^d Instruments transferred to Royal Obs. at Edinburgh in 1896.

^e City Obs. since 1896.

^f *Resultate des Internationalen Breitendienstes*, Band I, 1903.

^g Based upon data from the U. S. C. and G. Survey.

^h Point of reference before 1851, 7½ ft. N., 19 ft. W.

ⁱ At Bergedorf since 1909.

^j Transit instrument before 1908, 0° .5 N., 0° .04 W.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		[°] ['] ["]	['] ["]			^h ^m ^s	^s
94	Haverford, Pa. . . .	+40 0 40.1 ^a	-11 24.8	. . .	9.999398	+5 1 12.70 ^a	+49.48
95	Heidelberg, Baden . .	+49 23 55.2 ^b	-11 27.8	567 ^b	9.999198	-0 34 53.13 ^b	- 5.73
96	Heidelberg, Baden . .	+49 23 55.7 ^c	-11 27.8	570 ^c	9.999198	-0 34 52 96 ^c	- 5.73
97	Heidelberg, Baden . .	+49 24 34.3 ^d	-11 27.8	126 ^d	9.999168	-0 34 46.80 ^d	- 5.71
98	Helsingfors, Finland .	+60 9 42.3 ^e	-10 1.5	33 ^e	9.998903	-1 39 49.10 ^e	-16.40
99	Herény, Hungary . . .	+47 15 47.4	-11 33.7	229	9.999229	-1 6 24.7	-10.91
100	Hong Kong, China . .	+22 18 13.2 ^f	- 8 7.4	33 ^f	9.999793	-7 36 41.86 ^f	-75.01
101	Iowa City, Iowa . . .	+41 40 0	-11 30.7	183	9.999369	+6 6 6	+60.14
102	Ithaca, N. Y.	+42 26 47.3 ^g	-11 32.6	256 ^g	9.999354	+5 5 55.99 ^g	+50.26
103	Ithaca, N. Y.	+42 26 51.4	-11 32.6	. . .	9.999337	+5 5 56.47	+50.26
104	Jamaica, West Indies .	+18 24 51 ^h	- 6 55.9	540 ^h	9.999892	+5 11 29.48 ^h	+51.17
105	Jena, Saxe-Weimar . .	+50 55 34.9 ⁱ	-11 21.3	165 ⁱ	9.999132	-0 46 20.22 ⁱ	- 7.61
106	Jena, Saxe-Weimar . .	+50 55 35.8	-11 21.3	155	9.999131	-0 46 20.31	- 7.61
107	Jena, Saxe-Weimar . .	+50 56 11.0	-11 21.3	174	9.999132	-0 46 20.73	- 7.61
108	Johannesburg, Transvaal	-26 10 54.6 ^j	+ 9 9.8	1804 ^j	9.999840	-1 52 18.0 ^j	-18.45
109	Kalocsa, Hungary . . .	+46 31 41.7 ^h	-11 34.8	117 ^k	9.999240	-1 15 54.12 ^h	-12.47
110	Kasan, Russia	+55 50 20.0 ^e	-10 47.3	98 ^e	9.999007	-3 15 15.61 ^e	-32.08
111	Kasan, Russia	+55 47 23.9 ^l	-10 47.7	79 ^l	9.999007	-3 16 29.00 ^l	-32.28
112	Kew, England	+51 28 6	-11 18.5	10	9.999108	+0 1 15.1	+ 0.21
113	Kief, Russia	+50 27 10.0 ^m	-11 23.5	179 ^e	9.999145	-2 2 0.56 ^e	-20.04
114	Kiel, Prussia	+54 20 27.6 ^e	-10 59.7	52 ^e	9.999040	-0 40 35.45 ^e	- 6.67
115	Kis-Kartal, Hungary .	+47 41 54.8	-11 32.8	. . .	9.999202	-1 18 11.7	-12.85
116	Königsberg, Prussia . .	+54 42 50.5 ^e	-10 56.8	24 ^e	9.999029	-1 21 58.97 ^e	-13.47
117	Kremsmunster, Austria	+48 3 23.1 ^e	-11 32.0	384 ^e	9.999220	-0 56 31.58 ^e	- 9.29
118	La Plata, Arg. Rep. . .	-34 54 31.8 ⁿ	+10 52.2	18 ⁿ	9.999525	+3 51 44.8 ⁿ	+38.07
119	Leiden, Netherlands . .	+52 9 19.8 ^e	-11 14.6	6 ^e	9.999090	-0 17 56.15 ^e	- 2.95
120	Leipzig, Saxony	+51 20 5.9 ^o	-11 19.2	119 ^o	9.999118	-0 49 33.92 ^o	- 8.14
121	Leipzig, Saxony	+51 20 20.1	-11 19.2	. . .	9.999110	-0 49 29.92	- 8.13
122	Liege, Belgium	+50 37 6	-11 22.8	127	9.999137	-0 22 15.44	- 3.66
123	Lisbon (Tapada), Portugal	+38 42 30.5 ^p	-11 18.5	95 ^p	9.999437	+0 36 44.68 ^p	+ 6.04
124	Liverpool, England . .	+53 24 4.8	-11 6.6	61	9.999064	+0 12 17.33	+ 2.02
125	Liverpool, England . .	+53 24 47.8	-11 6.5	. . .	9.999059	+0 12 0.11	+ 1.97
126	Lund, Sweden	+55 41 51.6 ^o	-10 48.5	38	9.999006	-0 52 44.97 ^o	- 8.67
127	Lund, Sweden	+55 52 12.0	-10 47.0	. . .	9.999000	-0 52 47.50	- 8.67
128	Lussinpiccolo, Austria .	+44 32 11.0	-11 35.5	42	9.999286	-0 57 52.41	- 9.51
129	Lyons, France	+45 41 41.0	-11 35.5	299	9.999274	-0 19 8.52 ^q	- 3.14
130	Madison, Wis.	+43 4 36.8 ^e	-11 33.9	292 ^r	9.999340	+5 57 37.90 ^e	+58.75
131	Madras, India	+13 4 8.0 ^e	- 5 5.5	7	9.999926	-5 20 59.14	-52.73
132	Madrid, Spain	+40 24 30.0 ^s	-11 26.4	655 ^s	9.999433	+0 14 45.09 ^s	+ 2.42
133	Manila, P. I.	+14 34 41	- 5 38.2	3	9.999908	-8 3 54.2	-79.48
134	Mare Island, Cal. . . .	+38 5 55.8 ^t	-11 15.0	18 ^t	9.999447	+8 9 5.63 ^t	+80.35
135	Markree, Ireland . . .	+54 10 31.8	-11 1.0	45	9.999044	+0 33 48.4	+ 5.55
136	Marseilles, France . . .	+43 18 19 ^e	-11 34.3	75 ^u	9.999320	-0 21 34.55 ^e	- 3.54
137	Marseilles, France . . .	+43 17 52	-11 34.3	27	9.999317	-0 21 28.1	- 3.53
138	Mauritius (Port Louis) .	-20 5 39	+ 7 27.7	54	9.999832	-3 50 12.6	-37.82
139	Melbourne, Victoria . .	-37 49 53.2 ^v	+11 13.4	28 ^w	9.999454	-9 39 53.92 ^v	-95.26

^a Zenith telescope.^b Repsold meridian circle.^c Bruce telescope.^d Equatorial.^e Meridian circle.^f Transit instrument.^g Top of east pier in transit room.^h Transit instrument pier.ⁱ Bamberg equatorial.^j International latitude hut.^k Seven-inch equatorial.^l Center of great dome.^m Photographic equatorial, 41 feet

south of prime vertical transit.

ⁿ Gautier meridian circle.^o Center of observatory.^p Center of dome.^q Pier of small meridian circle.^r Main floor.^s Center of rotunda.^t East transit instrument.^u Barometer.^v Old meridian circle.^w Floor of meridian room.

No.	Authority for—		Description.
	Latitude.	Longitude.	
94	<i>Proc. Amer. Ph. Soc.</i> , 1883.	<i>Proc. Amer. Ph. Soc.</i> , 1883.	Haeverford College Obs.
95	Letter from Director, 1913.	Letter from Director, 1913.	Astron. Institute, Königstuhl Obs.
96	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	Astrophys. Inst., Königstuhl Obs.
97	<i>Publik. des Obs., Königstuhl</i> , 1902.	<i>Publik. des Obs., Königstuhl</i> , 1902.	^a Dr. Wolf's Obs. before 1898.
98	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
99	<i>Astron. Nach.</i> , Nr. 2633, 1884.	<i>British Nautical Almanac</i> .	Astrophysical Observatory.
100	<i>Hong Kong Observations</i> , 1897.	Letter from Director, 1897.	Colonial Observatory.
101	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Obs., Univ. of Iowa.
102	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^b Fuertes Obs., Cornell Univ.
103	Letter from the Dean, 1913.	Letter from the Dean, 1913.	^c Fuertes Obs., Cornell Univ.
104	<i>Memoirs, R. A. S.</i> , 1879.	See footnote (^d).	Mr. Hall's Obs., Montego Bay.
105	Letter from Director, 1913.	Letter from Director, 1913.	Univ. Obs., since 1888.
106	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Univ. Obs., before 1888.
107	<i>V. J. S. Astron. Gesell.</i> , 1910.	<i>V. J. S. Astron. Gesell.</i> , 1910.	The late Dr. Winkler's Obs.
108	Transvaal Obs. <i>Circular</i> , 1910.	Transvaal Obs. <i>Circular</i> , 1910.	Union Obs., formerly Transvaal Obs.
109	Letter from Director, 1913.	Letter from Director, 1913.	Archiepiscopal Haynald Obs.
110	Letter from Director, 1913.	Publications of the Obs., 1911.	Englehardt Obs., Univ. of Kasan.
111	Publications of the Obs., 1911.	Letter from Director, 1913.	University Observatory.
112	Letter from Director, 1897.	Letter from Director, 1897.	Meteorological Obs., London.
113	<i>Annales de l'Obs.</i> , Vol. IV, 1893.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
114	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^e Royal University Obs.
115	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Near Aszöd, Hungary.
116	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
117	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Benedictines.
118	Letter from Director, 1913.	Letter from Director, 1913.	National Univ. Obs.
119	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
120	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Obs., since 1861.
121	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1861.
122	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	University Obs., Cointe.
123	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Lisbon.
124	<i>Monthly Notices, R. A. S.</i> , 1894.	<i>Monthly Notices, R. A. S.</i> , 1894.	Bidston, Birkenhead, since 1867.
125	<i>British Nautical Almanac</i> , 1872.	<i>British Nautical Almanac</i> , 1872.	Liverpool Obs., before 1867.
126	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs., since 1867.
127	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	Royal Univ. Obs., before 1867.
128	Letter from Director, 1897.	Letter from Director, 1897.	Manora Observatory.
129	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of the Univ., St. Ganis Laval.
130	<i>Publications of the Obs.</i> , 1892.	Letter from Director, 1912.	Washburn Obs., Univ. of Wis.
131	<i>Great Trig. Survey of India</i> , 1906.	<i>Great Trig. Survey of India</i> , 1901.	Obs. founded by East India Co.
132	<i>Annuario del Obs.</i> , 1912.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Astron. and Meteorolog. Obs.
133	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Meteorological Observatory.
134	Letter from Director, 1913.	<i>Lick Obs. Bulletin</i> , 1908.	Chronom. and Time Sta., Navy Yd.
135	<i>Astron. Nach.</i> , Nr. 758, 1851.	<i>British Nautical Almanac</i> , 1901.	Col. Cooper's Observatory.
136	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	See footnote (^f).
137	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	See footnote (^g).
138	<i>Mag. and Meteor. Results</i> , 1908.	<i>Mag. and Meteor. Results</i> , 1908.	Royal Alfred Obs.
139	<i>Astron. Results</i> , 1881–84.	^h <i>Astron. Results</i> , 1881–84.	ⁱ Government Observatory.

^a Instruments transferred to the Astrophysical Institute of the Königstuhl Obs. in 1898.

^b Since 1902.

^c Before 1902.

^d *British Report on Transit of Venus*, 1882.

^e Old position of meridian circle, 0° 9' N., 0° 12' E.

^f National Obs., Univ. of Aix-Marseilles, since 1864–66.

^g National Obs., at Accoules, before 1864–66.

^h With the new values of the longitudes of Adelaide and Sydney.

ⁱ Transferred from Williamstown in 1861.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
140	Meudon, France . . .	+48 48 18	-11 29.8	162	9.999185	-0 8 55.6	- 1.47
141	Middletown, Conn. . .	+41 33 16.0	-11 30.4	. . .	9.999359	+4 50 37.18	+47.74
142	Milan, Italy . . .	+45 27 59.3	-11 35.6	120	9.999268	-0 36 45.88 ^a	- 6.04
143	Minneapolis, Minn. . .	+44 58 40.0 ^b	-11 35.7	260 ^b	9.999290	+6 12 57.04 ^b	+61.27
144	Mizusawa, Japan . . .	+39 8 3.6 ^c	-11 20.7	62	9.999424	-9 24 30.75	-92.74
145	Modena, Italy . . .	+44 38 51.4	-11 35.6	64	9.999285	-0 43 43.40	- 7.18
146	Montevideo, Uruguay . .	-34 54 33	+10 52.2	24	9.999525	+3 44 51.4	+36.94
147	Montreal, Canada . . .	+45 30 20 ^d	-11 35.6	57 ^d	9.999262	+4 54 18.63 ^d	+48.35
148	Moscow (Presnia), Russia	+55 45 19.5	-10 48.0	150 ^e	9.999012	-2 30 17.03 ^e	-24.69
149	Mount Hamilton, Cal. . .	+37 20 25.6 ^b	-11 10.4	1284 ^b	9.999552	+8 6 34.89 ^b	+79.93
150	Mount Wilson, Cal. . .	+34 12 59.5 ^f	-10 46.2	1799 ^f	9.999663	+7 52 14.33 ^f	+77.58
151	Mount Wilson, Cal. . .	+34 12 55	-10 46.1	1727 ^g	9.999658	+7 52 14.3	+77.58
152	Munich, Bavaria . . .	+48 8 45.5 ^h	-11 31.7	529 ^h	9.999227	-0 46 26.02 ^h	- 7.63
153	Naples, Italy . . .	+40 51 46.3	-11 28.1	164	9.999388	-0 57 1.70 ⁱ	- 9.37
154	Nashville, Tenn. . .	+36 8 54.4 ^b	-11 2.0	172 ^j	9.999505	+5 47 12.2	+57.04
155	Neuchâtel, Switzerland	+46 59 50.6	-11 34.1	488	9.999254	-0 27 49.90 ^e	- 4.57
156	New Brunswick, N. J. . .	+40 30 1.4 ^b	-11 26.7	21 ^b	9.999387	+4 57 47.45 ^b	+48.92
157	New Haven, Conn. . .	+41 19 22.3	-11 29.6	40	9.999368	+4 51 40.58	+47.92
158	New Haven, Conn. . .	+41 18 36.5	-11 29.6	. . .	9.999365	+4 51 42.16	+47.92
159	New York, N. Y. . .	+40 48 34.6	-11 27.9	25	9.999380	+4 55 50	+48.60
160	New York, N. Y. . .	+40 45 23.1	-11 27.7	. . .	9.999379	+4 55 53.64	+48.61
161	Nice, France . . .	+43 43 16.9 ^k	-11 34.9	378	9.999330	-0 29 12.15 ^k	- 4.80
162	Nikolaieff, Russia . . .	+46 58 22.1	-11 34.2	55	9.999225	-2 7 53.78 ⁱ	-21.01
163	North Abington, Mass. . .	+42 7 43.8 ^l	-11 31.9	43 ^l	9.999348	+4 43 45.56 ^l	+46.61
164	Northampton, Mass. . .	+42 19 1.9 ^b	-11 32.4	70 ^b	9.999345	+4 50 33.10 ^b	+47.73
165	Northfield, Minn. . .	+44 27 41.6 ^m	-11 35.5	290 ^m	9.999305	+6 12 35.92 ^m	+61.21
166	Oakland, Cal. . .	+37 48 5 ^e	-11 13.2	11 ^e	9.999454	+8 9 6.55 ^e	+80.35
167	Odessa, Russia . . .	+46 28 37.5	-11 34.9	. . .	9.999234	-2 3 2.18 ^b	-20.21
168	Odessa, Russia . . .	+46 28 36.7 ^e	-11 34.9	55 ^e	9.999237	-2 3 2.04 ^e	-20.21
169	O-Gyalla, Hungary . . .	+47 52 27.3	-11 32.4	113	9.999206	-1 12 45.49	-11.95
170	Omaha, Nebr. . .	+41 16 5.6 ^b	-11 29.5	344 ^b	9.999390	+6 23 46.96 ^b	+63.05
171	Orono, Me. . .	+44 54 0	-11 35.6	38	9.999277	+4 34 40.3	+45.12
172	Ottawa, Canada . . .	+45 23 39.1 ^e	-11 35.6	85 ⁿ	9.999267	+5 2 51.98 ^e	+49.75
173	Oxford, Miss. . .	+34 22 12.6	-10 47.5	. . .	9.999536	+5 58 7.18	+58.83
174	Oxford, England . . .	+51 45 35.6 ^e	-11 16.9	65 ^o	9.999104	+0 5 2.6	+ 0.83
175	Oxford, England . . .	+51 45 34.2	-11 16.9	64	9.999104	+0 5 0.40	+ 0.82
176	Padua, Italy . . .	+45 24 1.0 ^p	-11 35.6	31 ^q	9.999263	-0 47 29.13 ^p	- 7.80
177	Palermo, Sicily . . .	+38 6 44.0 ^r	-11 15.1	76 ^e	9.999451	-0 53 25.87	- 8.78
178	Paris, France . . .	+48 50 11.2 ^s	-11 29.8	67 ^t	9.999178	-0 9 20.93 ^u	- 1.53
179	Perth, West Australia . .	-31 57 8.9 ^e	+10 23.8	60	9.999597	-7 43 21.51 ^e	-76.12
180	Philadelphia, Pa. . .	+39 58 2.1 ^v	-11 24.6	74 ^v	9.999404	+5 1 6.81 ^v	+49.46
181	Pola, Austria . . .	+44 51 48.6 ^e	-11 35.6	32 ^e	9.999277	-0 55 23.07 ^e	- 9.10
182	Potsdam, Prussia . . .	+52 22 56.0 ^w	-11 13.3	97 ^w	9.999091	-0 52 15.86 ^w	- 8.59
183	Poughkeepsie, N. Y. . .	+41 41 18	-11 30.8	61	9.999360	+4 55 33.6 ^b	+48.55
184	Prague, Bohemia . . .	+50 5 16.0 ^v	-11 25.1	197 ^v	9.999155	-0 57 40.28 ^v	- 9.47
185	Princeton, N. J. . .	+40 20 55.8	-11 26.1	75	9.999395	+4 58 39.44	+49.06
186	Princeton, N. J. . .	+40 20 57.8 ^e	-11 26.1	65 ^e	9.999394	+4 58 37.61 ^e	+49.06

^a Center of great dome.^b Transit instrument.^c Zenith telescope.^d East transit pier.^e Meridian circle.^f Snow telescope pier.^g Floor.^h West dome.ⁱ Center of observatory.^j Bench mark on obs. steps.^k Small meridian circle.^l Base of pillar of 5-in. equatorial.^m Meridian circle pier.ⁿ Bench mark in east wall.^o Barometer basin.^p Axis of tower.^q Barometer.^r Center of south dome.^s South facade of observatory.^t Level of obs. terrace.^u Cassini's Meridian.^v Center of dome.^w Center of middle dome.

No.	Authority for—		Description.
	Latitude.	Longitude.	
140	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Seine-et-Oise, near Paris.
141	Letter from Director, 1894.	Letter from Director, 1894.	Wesleyan University Obs.
142	<i>Pubbl. del R. Osserv.</i> , 1914.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory, Brera.
143	Letter from Director, 1915.	Letter from Director, 1915.	Obs. Univ. of Minn.
144	See footnote (a).	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	International Lat. Obs.
145	Letter from Director, 1913.	Letter from Director, 1913.	Royal Univ. Geophysical Obs.
146	Letter from Director, 1919.	Letter from Director, 1919.	Meteorolog. Inst., Central Obs.
147	Letter from Director, 1912.	<i>U. S. C. and G. S. Report</i> , 1897.	McGill University Obs.
148	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of the Imperial Univ.
149	<i>Publications of the Obs.</i> , 1900.	<i>U. S. C. and G. S. Report</i> , 1897.	Lick Obs., Univ. of Cal.
150	<i>Astrophysical Journal</i> , 1906.	<i>Astrophysical Journal</i> , 1906.	Solar Obs., Carnegie Inst.
151	Letter from C. G. Abbot, 1912.	Letter from C. G. Abbot, 1912.	Branch of Smithson. Astrophys. Obs.
152	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Observatory.
153	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Obs., Capo di Monte.
154	Letter from the Dean, 1913.	Letter from Director, 1893.	Obs. of Vanderbilt Univ.
155	Swiss Triangulation, 1890.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Cantonal Observatory.
156	Letter from Director, 1913.	Letter from Director, 1913.	Schanck Obs., Rutgers College.
157	Letter from Director, 1893.	See footnote (b).	Yale Univ. Obs., since 1882.
158	Letter, Director new Obs., 1893.	Letter, Director new Obs., 1893.	Yale Univ. Obs., before 1882.
159	<i>Contributions from the Obs.</i> , 1906.	<i>Contributions from the Obs.</i> , 1906.	Columbia Univ. Obs., since 1897.
160	Letter from Director, 1879.	<i>British Nautical Almanac.</i>	Columbia Univ. Obs., before 1897.
161	<i>Annales de l'Obs.</i> , Tome II, 1887.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Mt. Gros, near Nice.
162	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Naval Observatory.
163	Letter from Director, 1917.	Letter from Director, 1917.	Mr. Burbeck's Observatory.
164	Letter from Director, 1913.	<i>Harvard Annals</i> , 1893.	Smith College Obs.
165	Letter from Director, 1912.	<i>Publications of Obs.</i> , 1901.	c Goodsell Obs., Carleton College.
166	Letter from Director, 1912.	Letter from Director, 1912.	Chabot Observatory.
167	Pulkowa <i>Mitteilungen</i> , No. 56, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Branch of Pulkowa Obs.
168	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
169	Letter from Director, 1897.	Letter from Director, 1897.	Royal Astrophysical Obs.
170	Letter from Director, 1912.	Letter from Director, 1912.	Creighton University Obs.
171	Letter from Director, 1912.	Letter from Director, 1912.	Obs. Univ. of Maine.
172	Letter from Chief Astronomer, 1913.	Letter from Chief Astronomer, 1913.	Dominion Observatory.
173	<i>Smithsonian Report</i> , 1880.	<i>Smithsonian Report</i> , 1880.	Obs. Univ. of Mississippi.
174	<i>Radcliffe Catalogue of Stars</i> , 1900.	<i>Radcliffe Observations</i> , 1842.	Radcliffe Observatory.
175	<i>Oxford Astron. Observations</i> , 1878.	<i>Oxford Astron. Observations</i> , 1878.	University Observatory.
176	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal University Obs.
177	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Royal Observatory.
178	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Observatory of Paris.
179	<i>Meridian Observations</i> , Vol. 2, 1908.	d <i>Meridian Observations</i> , Vol. 2, 1908.	Government Observatory.
180	Letter from Director, 1913.	Letter from Director, 1913.	Flower Obs., Univ. of Pa.
181	Letter from Director, 1913.	Letter from Director, 1913.	See footnote (e).
182	<i>Veroff. K. Preuss. Geol. Inst.</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Astrophysical Obs.
183	<i>Smithsonian Report</i> , 1880.	<i>Smithsonian Report</i> , 1880.	Vassar College Obs.
184	<i>Prague Observations</i> , 1907.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial and Royal Obs.
185	Letter from Director, 1913.	Letter from Director, 1913.	Halsted Obs., Princeton Univ.
186	Letter from Director, 1913.	<i>Washington Observations</i> , 1878.	Obs. of Instruction, Princeton Univ.

a *Resultate des Internationalen Breitendienstes*, 1900-1908.

b Based upon data from the U. S. C. and G. Survey.

c Old Observatory, 1877-1886, 415 feet W.

d With the new value of the longitude of Sydney.

e Observatory of Imperial and Royal Hydrographic Office.

No.	Place.	Latitude.	Reduction to Geocen- tric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Green- wich to Local S.T.M.N.
		° ' "	' "			h m s	s
187	Providence, R. I. . . .	+41 50 21	-11 31.2	64	9.999356	+ 4 45 35.95	+46.92
188	Providence, R. I. . . .	+41 49 46.4	-11 31.2	. . .	9.999352	+ 4 45 37.64	+46.92
189	Pulkowa, Russia . . .	+59 46 18.7 ^a	-10 6.2	75 ^b	9.998914	- 2 1 18.57 ^a	-19.93
190	Quebec, Canada . . .	+46 47 59.2	-11 34.4	90	9.999231	+ 4 44 52.71 ^c	+46.80
191	Quito, Ecuador . . .	- 0 14 0	+ 0 5.6	2908	0.000198	+ 5 14 6.66	+51.60
192	Riga, Russia	+56 57 9.3	-10 36.9	. . .	9.998974	- 1 36 28.10 ^d	-15.85
193	Rio de Janeiro, Brazil .	-22 54 23.8 ^e	+ 8 17.7	62 ^e	9.999784	+ 2 52 41.4 ^e	+28.37
194	Rochester, N. Y. . . .	+43 10 36.7 ⁿ	-11 34.1	150 ⁿ	9.999328	+ 5 10 29.64 ⁿ	+51.01
195	Rome, Italy	+41 53 53.6 ^f	-11 31.3	51 ^g	9.999354	- 0 49 55.12 ^f	- 8.20
196	Rome, Italy	+41 53 33.6 ^f	-11 31.3	65 ^b	9.999355	- 0 49 56.34 ^f	- 8.20
197	Rome, Italy	+41 54 12.4 ^f	-11 31.4	100 ^f	9.999357	- 0 49 48.02 ^f	- 8.18
198	Rome, Italy	+41 54 16.7	-11 31.4	75 ^g	9.999355	- 0 49 49.28 ^f	- 8.18
199	San Fernando, Spain . .	+36 27 42.0 ^h	-11 4.3	30 ^h	9.999488	+ 0 24 49.32 ^h	+ 4.08
200	San Fernando, Spain . .	+36 31 7	-11 4.7	. . .	9.999485	+ 0 25 10.82	+ 4.14
201	San Francisco, Cal. . .	+37 47 27.9	-11 13.2	. . .	9.999454	+ 8 9 42.86 ⁱ	+80.45
202	San Luis, Arg. Rep. . .	-33 17 45.7	+10 37.6	800	9.999616	+ 4 25 22	+43.60
203	Santiago, Chile	-33 26 42 ^f	+10 39.0	520 ^f	9.999594	+ 4 42 46.0 ^f	+46.45
204	Santiago, Chile	-33 26 25	+10 38.9	619	9.999600	+ 4 42 36.5	+46.42
205	Santiago, Chile	-33 33 46 ^c	+10 40.1	580 ^c	9.999595	+ 4 42 46 ^c	+46.45
206	South Bethlehem, Pa. .	+40 36 23.2 ^e	-11 27.2	110	9.999391	+ 5 1 31.96 ^e	+49.53
207	South Hadley, Mass. . .	+42 15 18.2 ^c	-11 32.2	76 ^c	9.999346	+ 4 50 20.40 ^c	+47.70
208	Springfield, Ill. . . .	+39 48 58.6 ^c	-11 23.9	187 ^c	9.999416	+ 5 58 34.20 ^c	+58.90
209	St. Louis, Mo.	+38 38 3.0	-11 18.1	. . .	9.999432	+ 6 0 49.26	+59.27
210	St. Petersburg, Russia .	+59 56 32.0	-10 4.2	4	9.998906	- 2 1 11.4	-19.91
211	Stockholm, Sweden . .	+59 20 32.7 ^f	-10 11.3	44 ^f	9.998922	- 1 12 13.97 ^f	-11.87
212	Stonyhurst, England . .	+53 50 40	-11 3.4	117 ^f	9.999056	+ 0 9 52.68	+ 1.62
213	Strassburg, Alsace . . .	+48 35 0.3 ^f	-11 30.5	144 ^f	9.999190	- 0 31 4.52 ^f	- 5.11
214	Swarthmore, Pa. . . .	+39 54 23.3	-11 24.3	. . .	9.999401	+ 5 1 24.89	+49.52
215	Sydney, N. S. W. . . .	-33 51 41.1	+10 42.9	44	9.999552	-10 4 49.31	-99.36
216	Syracuse, N. Y. . . .	+43 2 13.1	-11 33.9	160	9.999332	+ 5 4 33.36	+50.03
217	Syracuse, N. Y. . . .	+43 0 48.8 ^j	-11 33.8	137 ^k	9.999332	+ 5 4 34.31 ^j	+50.03
218	Tacubaya, Mexico . . .	+19 24 17.9 ^f	- 7 14.8	2285 ^f	9.999995	+ 6 36 46.67 ^f	+65.18
219	Tashkent, Turkestan . .	+41 19 31.3	-11 29.6	457	9.999396 ^l	- 4 37 10.80	-45.53
220	Taunton, Mass.	+41 54 0	-11 31.3	8	9.999351	+ 4 44 20	+46.71
221	Teramo, Italy	+42 39 27 ^l	-11 33.1	398	9.999358	- 0 54 56	- 9.02
222	Tokyo, Japan	+35 39 17.0 ^f	-10 58.3	25	9.999507	- 9 18 58.22 ^r	-91.82
223	Toronto, Canada	+43 39 46.0 ^m	-11 34.8	110 ⁿ	9.999313	+ 5 17 34.70 ⁿ	+52.17
224	Toronto, Canada	+43 40 0.8 ⁿ	-11 34.8	116 ⁿ	9.999313	+ 5 17 35.60 ⁿ	+52.17
225	Toulouse, France . . .	+43 36 44.0	-11 34.7	194	9.999320	- 0 5 51.23	- 0.96
226	Triest, Austria	+45 38 35.5 ^j	-11 35.5	68 ^o	9.999260	- 0 55 5.23 ^j	- 9.05
227	Triest, Austria	+45 38 45.4 ^p	-11 35.5	26 ^o	9.999257	- 0 55 3.0	- 9.04
228	Tschardjui, Turkestan .	+39 8 11.0 ^l	-11 20.7	188 ^l	9.999433	- 4 14 17.2 ^l	-41.77
229	Tschardjui, Turkestan .	+39 8 10.7 ^l	-11 20.7	167	9.999431	- 4 13 57.3	-41.72
230	Tulse Hill, England . .	+51 26 47	-11 18.6	48	9.999111	+ 0 0 27.7	+ 0.08
231	Turin, Italy	+45 2 16.3 ^q	-11 35.7	616 ^q	9.999313	- 0 31 5.96 ^q	- 5.11
232	Turin, Italy	+45 4 8.3 ^f	-11 35.7	276 ^o	9.999288	- 0 30 47.15 ^f	- 5.06
233	Tuscaloosa, Ala. . . .	+33 12 36.8 ^f	-10 36.7	69	9.999568	+ 5 50 11.74 ^f	+57.53

^a Center of observatory.^b Main floor.^c Transit instrument.^d Tower of school.^e Center of dome.^f Meridian circle.^g Barometer.^h Center of building, ground floor.ⁱ West transit pier.^j Equatorial pier.^k Intersection of equatorial axes.^l Zenith telescope.^m Main dome.ⁿ Transit pier.^o Barometer cistern.^p Stone pier in terrace wall.^q Prime vertical instrument.^r Great transit instrument.

No.	Authority for—		Description.
	Latitude.	Longitude.	
187	Letter from Director, 1893.	Letter from Director, 1893.	Ladd Obs., Brown Univ.
188	<i>Astron. Nach.</i> , Nr. 2254, 1879.	<i>Astron. Nach.</i> , Nr. 2254, 1879.	Mr. Seagrave's Observatory.
189	<i>Description de l'Obs.</i> , 1845.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. Central Nicolas.
190	Letter from Director, 1912.	Letter from Director, 1912.	Quebec Obs., Plains of Abraham.
191	Letter from Director, 1897.	Letter from Director, 1897.	National Observatory.
192	Letter from Director, 1897.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Polytechnic School Obs.
193	See footnote (a).	See footnote (a).	National Observatory.
194	U. S. C. and G. Survey.	U. S. C. and G. Survey.	Obs., Bausch & Lomb Optical Co.
195	<i>Memorie del R. Osserv.</i> , 1904.	Letter from Director, 1913.	Royal Obs. at Roman College.
196	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Royal Univ. Obs. at Capitol.
197	Letter from Director, 1913.	Letter from Director, 1913.	Vatican Obs., since 1906-7.
198	<i>Publ. della Specola Vaticana</i> , 1905.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^b Vatican Obs., before 1906-7.
199	<i>Annales del Obs.</i> , 1892.	Letter from Director, 1913.	Naval Obs., since 1797.
200	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^c Naval Obs., before 1797.
201	Letter from Director, 1897.	U. S. C. and G. S. Report, 1897.	Davidson Observatory.
202	Letter from Director, 1911.	Letter from Director, 1911.	Southern Obs. of Carnegie Inst.
203	Letter from Director, 1913.	Letter from Director, 1913.	^d National Obs., since 1862.
204	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	^e National Obs., before 1862.
205	Letter from Director, 1913.	Letter from Director, 1913.	National Obs., Espejo.
206	Letter from Director, 1913.	<i>Washington Observations</i> , 1875.	Sayre Obs., Lehigh Univ.
207	<i>Amer. Jour. of Sci.</i> , 1883.	Letter from Director, 1913.	Williston Obs., Mt. Holyoke Coll.
208	Letter from Director, 1916.	Letter from Director, 1916.	Obs. of Illinois Watch Co.
209	Letter from Director, 1897.	U. S. C. and G. S. Report, 1897.	^f Washington University Obs.
210	<i>Astron. Nach.</i> , Nr. 2582, 1884.	<i>Astron. Nach.</i> , Nr. 2582, 1884.	Imperial University Obs.
211	Letter from Director, 1914.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Obs. of Acad. of Sci.
212	Letter from Director, 1913.	<i>Monthly Notices, R. A. S.</i> , 1851.	Stonyhurst College Obs.
213	<i>Annalen der Sternw.</i> , 1896.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Univ. Obs.
214	Letter from Director, 1912.	Letter from Director, 1912.	Sprong Obs., Swarthmore College.
215	<i>Astron. Results</i> , 1879-81.	See footnote (g).	Government Observatory.
216	Letter from Director, 1891.	Letter from Director, 1891.	Syracuse Univ. Obs.
217	Letter from Director, 1914.	Letter from Director, 1914.	Roe Observatory.
218	<i>Boletin del Obs.</i> , 1914.	<i>Annuario del Obs.</i> , 1902.	National Observatory.
219	Letter from Director, 1897.	Letter from Director, 1897.	Tashkent Observatory.
220	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Mr. Metcalf's Obs., before 1911.
221	<i>Publ. dell'Osserv.</i> , 1900.	Letter from Director, 1913.	Collurania Observatory.
222	<i>Annales de l'Obs.</i> , 1894.	<i>Annales de l'Obs.</i> , 1894.	University Observatory.
223	Letter from Director, 1913.	Letter from Director, 1913.	University Observatory.
224	Letter from Director, 1912.	Letter from Director, 1912.	Meteorological Observatory.
225	<i>Annales de l'Obs.</i> , 1912.	British <i>Nautical Almanac</i> .	University Observatory.
226	Letter from Director, 1913.	Letter from Director, 1913.	^h Imperial and Royal Maritime Obs.
227	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	ⁱ Imperial and Royal Maritime Obs.
228	<i>Astron. Nach.</i> , Nr. 4588, 1912.	Letter from Director, 1913.	International Lat. Obs., since 1909.
229	See footnote (j).	See footnote (k).	International Lat. Obs., before 1909.
230	British <i>Nautical Almanac</i> .	British <i>Nautical Almanac</i> .	Obs. of Sir W. Huggins, London.
231	Letter from Director, 1915.	Letter from Director, 1915.	^l Royal Obs. of the Univ., since 1913.
232	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	^m Royal Obs. of the Univ., before 1913.
233	Letter from Director, 1897.	Letter from Director, 1897.	Obs. Univ. of Ala.

^a Green and Davis, *Telegraphic Determinations of Longitudes on the East Coast of South America*, 1880.

^b In the Gregorian tower.

^c In Cadiz.

^d In Quinta Normal.

^e On the hill Santa Lucia, in Santiago.

^f Old observatory No. 125 E.

^g Letter from Government Astronomer at Adelaide, 1913.

^h Since 1898.

ⁱ Before 1898.

^j *Resultate des Internationalen Breitendienstes*, 1900-1908.

^k *Resultate des Internationalen Breitendienstes*, Band I, 1903.

^l At Pino Torinese.

^m At Palazzo Madama.

No.	Place.	Latitude.	Reduction to Geocentric Latitude.	Altitude (Meters).	Log ρ (Including altitude).	Longitude from Greenwich.	Reduction from Greenwich to Local S.T.M.N.
		° ' "	' "			h m s	s
234	Ukiah, Cal.	+39 8 12.1 ^a	-11 20.7	220 ^a	9.999435	+ 8 12 50.3 ^a	+ 80.96
235	Upsala, Sweden . . .	+59 51 29.4 ^b	-10 5.2	21 ^b	9.998909	- 1 10 30.12 ^b	- 11.58
236	Urbana, Ill.	+40 6 20.2 ^c	-11 25.2	236 ^c	9.999412	+ 5 52 53.90 ^c	+ 57.97
237	Utrecht, Netherlands .	+52 5 9.7 ^d	-11 15.0	12 ^d	9.999093	- 0 20 31.0 ^d	- 3.37
238	Utrecht, Netherlands .	+52 5 13	-11 15.0	23	9.999093	- 0 20 28.9	- 3.36
239	Venice, Italy	+45 26 10.5 ^e	-11 35.6	15 ^e	9.999261	- 0 49 22.12 ^e	- 8.11
240	Victoria, B. C.	+48 31 15.7 ^m	-11 30.7	. . .	9.999182	+ 8 13 40.17 ^m	+ 81.10
241	Vienna, Austria	+48 13 55.1 ^f	-11 31.5	240 ^g	9.999205	- 1 5 21.35 ^f	- 10.74
242	Vienna, Austria	+48 12 35.5	-11 31.6	186 ^g	9.999202	- 1 5 31.61	- 10.76
243	Vienna, Austria	+48 12 53.8	-11 31.6	214	9.999204	- 1 5 25.17	- 10.75
244	Vienna, Austria	+48 12 46.7 ^e	-11 31.6	285	9.999209	- 1 5 10.96	- 10.71
245	Warsaw, Russia	+52 13 4.6 ^e	-11 14.3	121 ^e	9.999097	- 1 24 7.25 ^e	- 13.82
246	Washington, D. C. . . .	+38 55 14.0 ^h	-11 19.6	82 ⁱ	9.999431	+ 5 8 15.78 ^h	+ 50.64
247	Washington, D. C. . . .	+38 53 38.7 ^j	-11 19.4	31 ^k	9.999428	+ 5 8 12.15 ^j	+ 50.63
248	Washington, D. C. . . .	+38 53 17.3 ^l	-11 19.4	10 ^l	9.999427	+ 5 8 6.24 ^l	+ 50.61
249	Washington, D. C. . . .	+38 56 14.8 ^m	-11 19.7	. . .	9.999425	+ 5 8 0.0 ^m	+ 50.60
250	Wellesley, Mass.	+42 17 34.8	-11 32.3	61	9.999344	+ 4 45 12.7	+ 46.85
251	Wellington, N. Z. . . .	-41 17 3.8 ^b	+11 29.5	127 ^b	9.999375	-11 39 4.27 ^b	-114.84
252	West Point, N. Y. . . .	+41 23 22.1	-11 29.9	170	9.999375	+ 4 55 50.55	+ 48.60
253	Wilhelmshaven, Germany	+53 31 52.1 ^e	-11 5.7	9 ^e	9.999057	- 0 32 35.06 ^e	- 5.35
254	Williams Bay, Wis. . . .	+42 34 12.6 ⁿ	-11 33.0	320 ⁿ	9.999355	+ 5 54 13.24 ⁿ	+ 58.19
255	Williamstown, Mass. . .	+42 42 30	-11 33.2	213	9.999344	+ 4 52 50	+ 48.10
256	Winchester, Mass. . . .	+42 27 11	-11 32.7	30	9.999338	+ 4 44 32.4	+ 46.74
257	Windsor, N. S. W. . . .	-33 36 30.8 ^b	+10 40.6	16 ^k	9.999556	-10 3 19.9	- 99.11
258	Zô-Sè, China	+31 5 48.0 ^e	-10 14.4	100 ^e	9.999619	- 8 4 44.82 ^e	- 79.63
259	Zurich, Switzerland . .	+47 22 38.3 ^e	-11 33.5	469 ^e	9.999243	- 0 34 12.26 ^e	- 5.62

^a Zenith telescope.
^b Transit instrument.
^c 12-inch equatorial.
^d Altazimuth pier.
^e Meridian circle.

^f Central dome.
^g Barometer cistern.
^h Center of the clock room.
ⁱ Ground floor of main building.
^j Small dome.

^k Barometer.
^l Siderostat pier.
^m Center of dome.
ⁿ 40-inch equatorial.

No.	Authority for—		Description.
	Latitude.	Longitude.	
234	See footnote (a).	Letter from Director, 1912.	International Lat. Obs.
235	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	University Observatory.
236	Letter from Director, 1913.	Letter from Director, 1913.	Obs., Univ. of Ill.
237	Letter from Director, 1913.	Letter from Director, 1913.	University Obs., since 1855.
238	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	University Obs., before 1855.
239	Letter from Director, 1913.	Letter from Director, 1913.	Obs. of the Nautical Institute.
240	Letter from Director, 1917.	Letter from Director, 1917.	Dominion Astrophysical Obs.
241	See footnote (b).	<i>Astron. Nach.</i> , Nr. 3993, 1905.	c Imperial and Royal Univ. Obs.
242	Letter, Director new Obs., 1913.	Letter, Director new Obs., 1913.	d Imperial and Royal Univ. Obs.
243	<i>Berliner Jahrbuch.</i>	<i>Berliner Jahrbuch.</i>	Oppolzer Obs., Josephstadt.
244	<i>Publik. der Sternw.</i> , 1892.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Kuffner Obs., Ottakring.
245	<i>Astron. Nach.</i> , Nr. 4666, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial University Obs.
246	U. S. Naval Obs. Publications, 1900.	U. S. C. and G. S. Report, 1897.	U. S. N. Obs., Georgetown Heights.
247	See footnote (c).	U. S. C. and G. S. Report, 1897.	U. S. Naval Obs., 1842–1893.
248	Letter from Director, 1912.	Letter from Director, 1912.	Smithsonian Astrophysical Obs.
249	<i>Astronomical Journal</i> , 1897.	<i>Astronomical Journal</i> , 1897.	Catholic Univ. Obs., Brookland.
250	Letter from Director, 1912.	<i>Les Obs. Astron.</i> , Bruxelles, 1907.	Whitin Obs., Wellesley College.
251	See footnote (f).	See footnote (f).	Hector Observatory.
252	Letter from Director, 1891.	Letter from Director, 1891.	g U. S. Military Academy.
253	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3993, 1905.	Imperial Naval Obs.
254	<i>Astrophysical Journal</i> , 1901.	<i>Astrophysical Journal</i> , 1901.	Yerkes Obs., Univ. of Chicago.
255	Letter from Director, 1893.	Letter from Director, 1893.	Field Memorial Obs., Williams Coll.
256	Letter from Director, 1913.	Letter from Director, 1913.	Mr. Metcalf's Obs., since 1911.
257	<i>Monthly Notices, R. A. S.</i> , 1884.	h <i>Monthly Notices, R. A. S.</i> , 1888.	Mr. John Tebbutt's Obs.
258	<i>Annales de l'Obs.</i> , 1907.	<i>Annales de l'Obs.</i> , 1907.	Obs. of the Jesuits near Shanghai.
259	Letter from Director, 1913.	<i>Astron. Nach.</i> , Nr. 3202, 1893.	Obs. of Swiss Polytechnic School.

a *Resultate des Internationalen Breitendienstes*, 1900–1908.b *Astron. Arbeiten des K. K. Gradmessungs-Bureau*, 1896.

c Since 1879.

d Before 1879.

e *Washington Observations* for 1892, Appendix I, pp. XXI and XXXII.f *Transactions of the New Zealand Institute*, Vol. XLVII, 1914.

g Old observatory 9' N., 1° 2 E.

h And the new value of the longitude of Sydney.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Ephemeris, in accordance with the decision of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, February 28, 1923, at 10 P. M., Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
 " α' and δ' = " " " " " " Moon

" D = Lunar Distance

Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$

Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

α	4 ^h 31 ^m 30 ^s .5	M	29° 35' 23''
α'	8 ^h 42 ^m 15 ^s .0	δ	+16° 21' 11''
$\alpha - \alpha'$	19 ^h 49 ^m 15 ^s .5	$M - \delta$	13° 14' 12''
$\alpha - \alpha'$	297° 18' 52''	$\sin \delta'$	9.401658
δ'	+ 14° 36' 17''	$\cos (M - \delta)$	9.988306
$\tan \delta'$	9.415922	$\operatorname{cosec} M$	0.306461
$\sec (\alpha - \alpha')$	0.338307	$\cos D$	9.696425
$\tan M$	9.754229	D	60° 11' 35''

EXAMPLE 2.

Find the lunar distance of Jupiter, March 8, 1923, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
 " α' and δ' = " " " " " " Moon

" D = Lunar Distance

Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$

Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$

Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

α	15 ^h 7 ^m 19 ^s .1	$\tan \frac{1}{2} (\alpha - \alpha')$	9.043745 n
α'	15 ^h 57 ^m 48 ^s .5	$\cos \frac{1}{2} (\delta + \delta')$	9.983230
$\alpha - \alpha'$	23 ^h 9 ^m 30 ^s .6	$\operatorname{cosec} \frac{1}{2} (\delta - \delta')$	2.130022 n
$\alpha - \alpha'$	347° 22' 39''	$\tan N$	1.156997
δ	- 16° 14' 42''	N	86° 0' 54''
δ'	- 15° 23' 44''	$\sin \frac{1}{2} (\alpha - \alpha')$	9.041105
$\delta + \delta'$	- 31° 38' 26''	$\cos \frac{1}{2} (\delta + \delta')$	9.983230
$\delta - \delta'$	- 0° 50' 58''	$\operatorname{cosec} N$	0.001051
$\frac{1}{2} (\alpha - \alpha')$	173° 41' 20''	$\sin \frac{1}{2} D$	9.025386
$\frac{1}{2} (\delta + \delta')$	- 15° 49' 13''	$\frac{1}{2} D$	6° 5' 8''
$\frac{1}{2} (\delta - \delta')$	- 0° 25' 29''	D	12° 10' 18''

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the apparent right ascension and declination of Polaris for the time of observation.

Subtract the apparent right ascension from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the apparent declination of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For altitudes other than 45° , corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—August 5, 1923, at $10^h 40^m 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be $33^\circ 20' 0''$, required the latitude of the place.

Local astronomical mean time	h	m	s
Reduction from Table III for $10^h 40^m 30^s$	10	40	30
Greenwich sidereal time of mean noon, August 5, page 10		+ 1	45
Reduction from Table III for longitude ($= 3^h 56^m$ west, or plus)	8	52	3
		+ 0	39
Sum (having regard to signs) is equal to local sidereal time	19	34	57
R. A. of Polaris (page 281) for time of observation	1	34	15
Remainder is equal to hour-angle of Polaris	18	0	42
Decl. of Polaris (page 281) for time of observation, $88^\circ 53' 21''$			
True altitude	+33	20	0
Correction from Table I		+ 0	27
Correction from Table Ia			-13
Latitude of the place	+33	20	14

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

Decl. H. A.	$88^\circ 53' 20''$	$88^\circ 53' 30''$	$88^\circ 53' 40''$	$88^\circ 53' 50''$	$88^\circ 54' 0''$	$88^\circ 54' 10''$	Decl. H. A.
h m	' "	' "	' "	' "	' "	' "	h m
0 0	-66 40 0	-66 30 0	-66 20 0	-66 10 0	-66 0 0	-65 50 0	24 0
3	66 40 1	66 30 1	66 20 1	66 10 1	66 0 1	65 50 1	23 57
6	66 39 2	66 29 2	66 19 2	66 9 2	65 59 2	65 49 2	54
9	66 37 3	66 27 3	66 17 3	66 7 3	65 57 3	65 47 3	51
12	66 34 3	66 24 3	66 14 3	66 4 3	65 54 3	65 44 3	48
0 15	-66 31 4	-66 21 4	-66 11 4	-66 1 4	-65 51 4	-65 41 4	23 45
18	66 27 4	66 17 4	66 7 4	65 57 4	65 47 4	65 38 4	42
21	66 23 5	66 13 5	66 3 5	65 53 5	65 43 5	65 33 5	39
24	66 18 6	66 8 6	65 58 6	65 48 6	65 38 6	65 28 6	36
27	66 12 7	66 2 7	65 52 7	65 42 7	65 32 7	65 22 7	33
0 30	-66 5 7	-65 55 7	-65 45 7	-65 35 7	-65 25 7	-65 16 7	23 30
33	65 58 8	65 48 8	65 38 8	65 28 8	65 18 8	65 8 8	27
36	65 50 9	65 40 9	65 30 9	65 20 9	65 10 9	65 0 9	24
39	65 41 9	65 31 9	65 21 9	65 11 9	65 2 9	64 52 9	21
42	65 32 10	65 22 10	65 12 10	65 2 10	64 52 10	64 43 10	18
0 45	-65 22 11	-65 12 11	-65 2 11	-64 52 10	-64 42 10	-64 33 10	23 15
48	65 11 11	65 1 11	64 51 11	64 42 11	64 32 11	64 22 11	12
51	65 0 12	64 50 12	64 40 12	64 30 12	64 21 12	64 11 12	9
54	64 47 12	64 38 12	64 28 12	64 18 12	64 9 12	63 59 12	6
0 57	64 35 13	64 25 13	64 15 13	64 6 13	63 56 13	63 46 13	3
1 0	-64 21 14	-64 11 14	-64 2 14	-63 52 14	-63 43 14	-63 33 14	23 0
3	64 7 15	63 57 14	63 48 15	63 38 15	63 29 15	63 19 15	22 57
6	63 52 15	63 43 15	63 33 15	63 23 15	63 14 15	63 4 15	54
9	63 37 16	63 27 16	63 18 16	63 8 16	62 59 16	62 49 16	51
1 12	-63 21 16	-63 11 16	-63 2 16	-62 52 16	-62 43 16	-62 33 16	22 48

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl. H. A.	88° 53' 20''	88° 53' 30''	88° 53' 40''	88° 53' 50''	88° 54' 0''	88° 54' 10''	Decl. H. A.
<div><div>h m</div><div>1 12</div><div>15</div><div>18</div><div>21</div><div>24</div><div>1 27</div><div>30</div><div>33</div><div>36</div><div>39</div><div>1 42</div><div>45</div><div>48</div><div>51</div><div>54</div><div>1 57</div><div>2 0</div><div>3</div><div>6</div><div>9</div><div>2 12</div><div>15</div><div>18</div><div>21</div><div>24</div><div>2 27</div><div>30</div><div>33</div><div>36</div><div>39</div><div>2 42</div><div>45</div><div>48</div><div>51</div><div>54</div><div>2 57</div><div>3 0</div><div>3</div><div>6</div><div>9</div><div>3 12</div><div>15</div><div>18</div><div>21</div><div>24</div><div>3 27</div><div>30</div><div>33</div><div>36</div><div>39</div><div>3 42</div><div>45</div><div>48</div><div>51</div><div>54</div><div>3 57</div><div>4 0</div><div>3</div><div>6</div><div>9</div></div>	<div><div>' ''</div><div>-63 21 17</div><div>63 4 18</div><div>62 46 18</div><div>62 28 19</div><div>62 9 19</div><div>-61 50 20</div><div>61 30 21</div><div>61 9 21</div><div>60 48 22</div><div>60 26 23</div><div>-60 3 23</div><div>59 40 24</div><div>59 16 24</div><div>58 52 25</div><div>58 27 26</div><div>-58 1 26</div><div>57 35 27</div><div>57 8 28</div><div>56 40 28</div><div>56 12 29</div><div>-55 43 29</div><div>55 14 30</div><div>54 44 30</div><div>54 14 31</div><div>53 43 32</div><div>-53 11 32</div><div>52 39 32</div><div>52 7 34</div><div>51 33 33</div><div>51 0 35</div><div>-50 25 34</div><div>49 51 36</div><div>49 15 35</div><div>48 40 37</div><div>48 3 37</div><div>-47 26 37</div><div>46 49 38</div><div>46 11 38</div><div>45 33 39</div><div>44 54 39</div><div>-44 15 39</div><div>43 36 40</div><div>42 56 41</div><div>42 15 41</div><div>41 34 41</div><div>-40 53 42</div><div>40 11 42</div><div>39 29 42</div><div>38 46 43</div><div>38 3 43</div><div>-37 20 44</div><div>36 36 44</div><div>35 52 45</div><div>35 7 45</div><div>34 22 45</div><div>-33 37 46</div><div>32 51 46</div><div>32 5 46</div><div>31 19 47</div><div>-30 32 47</div></div>	<div><div>' ''</div><div>-63 11 17</div><div>62 54 17</div><div>62 37 18</div><div>62 19 19</div><div>62 0 19</div><div>-61 41 20</div><div>61 21 21</div><div>61 0 21</div><div>60 39 22</div><div>60 17 23</div><div>-59 54 23</div><div>59 31 24</div><div>59 7 24</div><div>58 43 25</div><div>58 18 26</div><div>-57 52 26</div><div>57 26 27</div><div>56 59 27</div><div>56 32 28</div><div>56 4 29</div><div>-55 35 29</div><div>55 6 30</div><div>54 36 30</div><div>54 6 31</div><div>53 35 32</div><div>-53 3 32</div><div>52 31 32</div><div>51 59 33</div><div>51 26 34</div><div>50 52 34</div><div>-50 18 35</div><div>49 43 35</div><div>49 8 36</div><div>48 32 36</div><div>47 56 37</div><div>-47 19 37</div><div>46 42 38</div><div>46 4 38</div><div>45 26 38</div><div>44 48 39</div><div>-44 9 40</div><div>43 29 40</div><div>42 49 40</div><div>42 9 41</div><div>41 28 41</div><div>-40 47 42</div><div>40 5 42</div><div>39 23 42</div><div>38 40 43</div><div>37 57 43</div><div>-37 14 44</div><div>36 30 44</div><div>35 46 44</div><div>35 2 45</div><div>34 17 45</div><div>-33 32 46</div><div>32 46 46</div><div>32 0 46</div><div>31 14 46</div><div>-30 28 46</div></div>	<div><div>' ''</div><div>-63 2 17</div><div>62 45 17</div><div>62 28 18</div><div>62 10 19</div><div>61 51 20</div><div>-61 31 20</div><div>61 11 20</div><div>60 51 21</div><div>60 30 21</div><div>60 8 23</div><div>-59 45 23</div><div>59 22 24</div><div>58 58 24</div><div>58 34 25</div><div>58 9 26</div><div>-57 43 26</div><div>57 17 27</div><div>56 50 27</div><div>56 23 28</div><div>55 55 28</div><div>-55 27 29</div><div>54 58 30</div><div>54 28 30</div><div>53 58 31</div><div>53 27 32</div><div>-52 55 32</div><div>52 23 32</div><div>51 51 33</div><div>51 18 34</div><div>50 44 34</div><div>-50 10 34</div><div>49 36 35</div><div>49 1 36</div><div>48 25 36</div><div>47 49 37</div><div>-47 12 37</div><div>46 35 37</div><div>45 58 38</div><div>45 20 39</div><div>44 41 39</div><div>-44 2 39</div><div>43 23 40</div><div>42 43 40</div><div>42 2 41</div><div>41 22 41</div><div>-40 41 42</div><div>39 59 42</div><div>39 17 43</div><div>38 34 43</div><div>37 51 43</div><div>-37 8 43</div><div>36 25 44</div><div>35 41 44</div><div>34 57 45</div><div>34 12 45</div><div>-33 27 46</div><div>32 41 45</div><div>31 56 46</div><div>31 10 46</div><div>-30 23 47</div></div>	<div><div>' ''</div><div>-62 52 17</div><div>62 35 17</div><div>62 18 18</div><div>62 0 19</div><div>61 41 19</div><div>-61 22 20</div><div>61 2 20</div><div>60 42 21</div><div>60 21 21</div><div>59 59 23</div><div>-59 36 23</div><div>59 13 24</div><div>58 49 24</div><div>58 25 25</div><div>58 0 25</div><div>-57 35 26</div><div>57 9 27</div><div>56 42 27</div><div>56 15 28</div><div>55 47 29</div><div>-55 18 29</div><div>54 49 29</div><div>54 20 30</div><div>53 50 31</div><div>53 19 31</div><div>-52 48 32</div><div>52 16 32</div><div>51 43 33</div><div>51 10 33</div><div>50 37 34</div><div>-50 3 35</div><div>49 28 35</div><div>48 53 35</div><div>48 18 36</div><div>47 42 37</div><div>-47 5 37</div><div>46 28 37</div><div>45 51 38</div><div>45 13 39</div><div>44 34 39</div><div>-43 55 39</div><div>43 16 40</div><div>42 36 40</div><div>41 56 41</div><div>41 15 41</div><div>-40 34 41</div><div>39 53 41</div><div>39 11 42</div><div>38 29 42</div><div>37 46 43</div><div>-37 3 43</div><div>36 19 44</div><div>35 35 44</div><div>34 51 44</div><div>34 7 45</div><div>-33 22 45</div><div>32 37 46</div><div>31 51 46</div><div>31 5 46</div><div>-30 19 46</div></div>	<div><div>' ''</div><div>-62 43 17</div><div>62 26 17</div><div>62 9 18</div><div>61 51 19</div><div>61 32 19</div><div>-61 13 20</div><div>60 53 21</div><div>60 32 21</div><div>60 11 21</div><div>59 50 23</div><div>-59 27 23</div><div>59 4 23</div><div>58 41 25</div><div>58 16 24</div><div>57 52 26</div><div>-57 26 26</div><div>57 0 27</div><div>56 33 27</div><div>56 6 28</div><div>55 38 28</div><div>-55 10 29</div><div>54 41 30</div><div>54 11 30</div><div>53 41 30</div><div>53 11 31</div><div>-52 40 32</div><div>52 8 32</div><div>51 35 33</div><div>51 3 34</div><div>50 29 34</div><div>-49 55 34</div><div>49 21 35</div><div>48 46 35</div><div>48 11 36</div><div>47 35 37</div><div>-46 58 37</div><div>46 21 37</div><div>45 44 38</div><div>45 6 38</div><div>44 28 39</div><div>-43 49 39</div><div>43 10 40</div><div>42 30 40</div><div>41 50 41</div><div>41 9 41</div><div>-40 28 41</div><div>39 47 41</div><div>39 5 42</div><div>38 23 42</div><div>37 40 43</div><div>-36 57 43</div><div>36 14 44</div><div>35 30 44</div><div>34 46 44</div><div>34 2 45</div><div>-33 17 45</div><div>32 32 46</div><div>31 46 46</div><div>31 0 46</div><div>-30 14 46</div></div>	<div><div>' ''</div><div>-62 33 17</div><div>62 16 17</div><div>61 59 18</div><div>61 41 18</div><div>61 23 19</div><div>-61 4 20</div><div>60 44 21</div><div>60 23 21</div><div>60 2 21</div><div>59 41 23</div><div>-59 18 23</div><div>58 55 23</div><div>58 32 24</div><div>58 8 25</div><div>57 43 26</div><div>-57 17 26</div><div>56 51 26</div><div>56 25 27</div><div>55 58 28</div><div>55 30 28</div><div>-55 2 29</div><div>54 33 30</div><div>54 3 30</div><div>53 33 30</div><div>53 3 31</div><div>-52 32 32</div><div>52 0 32</div><div>51 28 33</div><div>50 55 33</div><div>50 22 34</div><div>-49 48 34</div><div>49 14 35</div><div>48 39 36</div><div>48 3 36</div><div>47 27 36</div><div>-46 51 37</div><div>46 14 37</div><div>45 37 38</div><div>44 59 38</div><div>44 21 39</div><div>-43 42 39</div><div>43 3 39</div><div>42 24 40</div><div>41 44 40</div><div>41 3 41</div><div>-40 22 41</div><div>39 41 41</div><div>38 59 42</div><div>38 17 42</div><div>37 35 43</div><div>-36 52 43</div><div>36 9 44</div><div>35 25 44</div><div>34 41 44</div><div>33 57 45</div><div>-33 12 45</div><div>32 27 46</div><div>31 41 46</div><div>30 56 46</div><div>-30 10 46</div></div>	<div><div>h m</div><div>22 48</div><div>45</div><div>42</div><div>39</div><div>36</div><div>22 33</div><div>30</div><div>27</div><div>24</div><div>21</div><div>22 18</div><div>15</div><div>12</div><div>9</div><div>6</div><div>22 3</div><div>22 0</div><div>21 57</div><div>54</div><div>51</div><div>21 48</div><div>45</div><div>42</div><div>39</div><div>36</div><div>21 33</div><div>30</div><div>27</div><div>24</div><div>21</div><div>21 18</div><div>15</div><div>12</div><div>9</div><div>6</div><div>21 3</div><div>21 0</div><div>20 57</div><div>54</div><div>51</div><div>20 48</div><div>45</div><div>42</div><div>39</div><div>36</div><div>20 33</div><div>30</div><div>27</div><div>24</div><div>21</div><div>20 18</div><div>15</div><div>12</div><div>9</div><div>6</div><div>20 3</div><div>20 0</div><div>19 57</div><div>54</div><div>51</div></div>

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl.		88° 53' 20"		88° 53' 30"		88° 53' 40"		88° 53' 50"		88° 54' 0"		88° 54' 10"		Decl.	
H. A.														H. A.	
h	m	'	"	'	"	'	"	'	"	'	"	'	"	h	m
4	9	-30	32	-30	28	-30	23	-30	19	-30	14	-30	10	19	51
	12	29	45	29	41	29	37	29	32	29	28	29	23		48
	15	28	58	28	54	28	50	28	45	28	41	28	37		45
	18	28	11	28	6	28	2	27	58	27	54	27	50		42
	21	27	23	27	19	27	15	27	11	27	7	27	3		39
4	24	-26	35	-26	31	-26	27	-26	23	-26	19	-26	15	19	36
	27	25	46	25	43	25	39	25	35	25	31	25	27		33
	30	24	58	24	54	24	51	24	47	24	43	24	39		30
	33	24	9	24	5	24	2	23	58	23	55	23	51		27
	36	23	20	23	16	23	13	23	10	23	6	23	3		24
4	39	-22	31	-22	27	-22	24	-22	21	-22	17	-22	14	19	21
	42	21	41	21	38	21	35	21	31	21	28	21	25		18
	45	20	51	20	48	20	45	20	42	20	39	20	36		15
	48	20	1	19	58	19	55	19	52	19	50	19	47		12
	51	19	11	19	8	19	5	19	2	19	0	18	57		9
4	54	-18	21	-18	18	-18	15	-18	12	-18	10	-18	7	19	6
4	57	17	30	17	27	17	25	17	22	17	20	17	17		3
5	0	16	39	16	37	16	35	16	32	16	30	16	27	19	0
	3	15	48	15	46	15	44	15	41	15	39	15	37		57
	6	14	57	14	55	14	53	14	51	14	49	14	46		54
5	9	-14	6	-14	4	-14	2	-14	0	-13	58	-13	56	18	51
	12	13	15	13	13	13	11	13	9	13	7	13	5		48
	15	12	23	12	21	12	20	12	18	12	16	12	14		45
	18	11	32	11	30	11	28	11	27	11	25	11	23		42
	21	10	40	10	38	10	37	10	35	10	34	10	32		39
5	24	-9	48	-9	47	-9	45	-9	44	-9	42	-9	41	18	36
	27	8	56	8	55	8	54	8	52	8	51	8	50		33
	30	8	4	8	3	8	2	8	1	8	0	7	58		30
	33	7	12	7	11	7	10	7	9	7	8	7	7		27
	36	6	20	6	19	6	18	6	17	6	16	6	16		24
5	39	-5	28	-5	27	-5	26	-5	25	-5	25	-5	24	18	21
	42	4	35	4	35	4	34	4	33	4	33	4	32		18
	45	3	43	3	43	3	42	3	42	3	41	3	41		15
	48	2	51	2	50	2	50	2	50	2	49	2	49		12
	51	1	58	1	58	1	58	1	58	1	58	1	57		9
5	54	-1	6	-1	6	-1	6	-1	6	-1	6	-1	6	18	6
5	57	-0	14	-0	14	-0	14	-0	14	-0	14	-0	14		3
6	0	+0	39	+0	39	+0	38	+0	38	+0	38	+0	38	18	0
	3	1	31	1	31	1	31	1	30	1	30	1	30		57
	6	2	24	2	23	2	23	2	22	2	22	2	21		54
6	9	+3	16	+3	15	+3	15	+3	14	+3	13	+3	13	17	51
	12	4	8	4	7	4	7	4	6	4	5	4	4		48
	15	5	0	4	59	4	59	4	58	4	57	4	56		45
	18	5	52	5	51	5	50	5	49	5	49	5	48		42
	21	6	45	6	43	6	42	6	41	6	40	6	39		39
6	24	+7	37	+7	35	+7	34	+7	33	+7	32	+7	30	17	36
	27	8	28	8	27	8	26	8	24	8	23	8	22		33
	30	9	20	9	19	9	17	9	16	9	14	9	13		30
	33	10	12	10	10	10	9	10	7	10	6	10	4		27
	36	11	4	11	2	11	0	10	58	10	57	10	55		24
6	39	+11	55	+11	53	+11	51	+11	49	+11	48	+11	46	17	21
	42	12	47	12	45	12	43	12	40	12	39	12	37		18
	45	13	38	13	36	13	34	13	31	13	29	13	27		15
	48	14	29	14	27	14	25	14	22	14	20	14	18		12
	51	15	20	15	17	15	15	15	13	15	10	15	8		9
6	54	+16	11	+16	8	+16	6	+16	3	+16	0	+15	58	17	6
6	57	17	1	16	58	16	56	16	53	16	51	16	48		3
7	0	17	52	17	49	17	46	17	43	17	41	17	38	17	0
	3	18	42	18	39	18	36	18	33	18	30	18	27		57
7	6	+19	32	+19	29	+19	26	+19	23	+19	20	+19	17	16	54

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl. H. A.		88° 53' 20''	88° 53' 30''	88° 53' 40''	88° 53' 50''	88° 54' 0''	88° 54' 10''	Decl. H. A.	
h	m	' "	' "	' "	' "	' "	' "	h	m
		' "	' "	' "	' "	' "	' "		
7	6	+19 32 50	+19 29 50	+19 26 50	+19 23 49	+19 20 49	+19 17 49	16	54
9		20 22 49	20 19 49	20 16 49	20 12 49	20 9 49	20 6 49		51
12		21 11 49	21 8 49	21 5 49	21 1 49	20 58 49	20 55 49		48
15		22 1 49	21 57 49	21 54 49	21 50 49	21 47 49	21 44 49		45
18		22 50 49	22 46 49	22 43 49	22 39 49	22 36 49	22 32 49		42
7	21	+23 39 49	+23 35 49	+23 32 48	+23 28 48	+23 24 48	+23 21 48	16	39
24		24 28 48	24 24 48	24 20 48	24 16 48	24 12 48	24 9 48		36
27		25 16 48	25 12 48	25 8 48	25 4 48	25 0 48	24 57 47		33
30		26 4 48	26 0 48	25 56 48	25 52 48	25 48 48	25 44 47		30
33		26 52 48	26 48 47	26 44 47	26 40 47	26 35 47	26 31 47		27
7	36	+27 40 47	+27 35 47	+27 31 47	+27 27 47	+27 22 47	+27 18 47	16	24
39		28 27 47	28 22 47	28 18 47	28 14 46	28 9 47	28 5 47		21
42		29 14 47	29 9 47	29 5 46	29 0 47	28 56 46	28 52 46		18
45		30 1 47	29 56 46	29 51 46	29 47 46	29 42 46	29 38 46		15
48		30 47 46	30 42 46	30 37 46	30 33 46	30 28 46	30 24 45		12
7	51	+31 33 46	+31 28 46	+31 23 46	+31 19 45	+31 14 45	+31 9 45	16	9
54		32 19 45	32 14 45	32 9 45	32 4 45	31 59 45	31 54 45		6
7	57	33 4 45	32 59 45	32 54 45	32 49 45	32 44 45	32 39 45		3
8	0	33 49 45	33 44 45	33 39 45	33 34 44	33 29 44	33 24 44	16	0
3		34 34 44	34 29 44	34 24 44	34 18 44	34 13 44	34 8 44	15	57
8	6	+35 18 44	+35 13 44	+35 8 43	+35 2 44	+34 57 43	+34 52 43	15	54
9		36 2 44	35 57 43	35 51 44	35 46 43	35 41 43	35 35 43		51
12		36 46 43	36 40 43	36 35 43	36 29 43	36 24 43	36 18 43		48
15		37 29 43	37 23 43	37 18 43	37 12 43	37 7 42	37 1 42		45
18		38 12 43	38 6 43	38 1 42	37 55 42	37 49 42	37 43 42		42
8	21	+38 55 42	+38 49 42	+38 43 42	+38 37 42	+38 31 42	+38 25 42	15	39
24		39 37 41	39 31 41	39 25 41	39 19 41	39 13 41	39 7 41		36
27		40 18 42	40 12 41	40 6 41	40 0 41	39 54 41	39 48 41		33
30		41 0 41	40 53 41	40 47 41	40 41 41	40 35 41	40 29 40		30
33		41 41 40	41 34 40	41 28 40	41 22 40	41 15 40	41 9 40		27
8	36	+42 21 40	+42 14 40	+42 8 40	+42 2 39	+41 55 40	+41 49 39	15	24
39		43 1 39	42 54 40	42 48 39	42 41 40	42 35 39	42 28 39		21
42		43 40 39	43 34 39	43 27 39	43 21 39	43 14 39	43 7 39		18
45		44 19 39	44 13 38	44 6 39	44 0 38	43 53 38	43 46 38		15
48		44 58 38	44 51 38	44 45 38	44 38 38	44 31 38	44 24 38		12
8	51	+45 36 38	+45 29 38	+45 23 37	+45 16 37	+45 9 37	+45 2 37	15	9
54		46 14 37	46 7 37	46 0 37	45 53 37	45 46 37	45 39 37		6
8	57	46 51 37	46 44 37	46 37 37	46 30 36	46 23 37	46 16 37		3
9	0	47 28 36	47 21 36	47 14 36	47 6 36	46 59 36	46 52 36	15	0
3		48 4 36	47 57 36	47 50 35	47 42 36	47 35 36	47 28 35	14	57
9	6	+48 40 35	+48 33 35	+48 25 35	+48 18 35	+48 11 35	+48 3 35	14	54
9		49 15 35	49 8 35	49 0 35	48 53 34	48 46 34	48 38 34		51
12		49 50 34	49 43 34	49 35 34	49 27 34	49 20 34	49 12 34		48
15		50 24 34	50 17 34	50 9 34	50 1 34	49 54 34	49 46 34		45
18		50 58 33	50 51 33	50 43 33	50 35 33	50 27 33	50 20 33		42
9	21	+51 31 33	+51 24 32	+51 16 32	+51 8 33	+51 0 33	+50 53 32	14	39
24		52 4 32	51 56 32	51 48 32	51 41 32	51 33 32	51 25 32		36
27		52 36 32	52 28 32	52 20 32	52 13 31	52 5 32	51 57 31		33
30		53 8 31	53 0 31	52 52 31	52 44 31	52 36 31	52 28 31		30
33		53 39 31	53 31 30	53 23 30	53 15 30	53 7 30	52 59 30		27
9	36	+54 10 30	+54 1 30	+53 53 30	+53 45 30	+53 37 30	+53 29 30	14	24
39		54 40 29	54 31 30	54 23 29	54 15 29	54 7 29	53 59 29		21
42		55 9 29	55 1 29	54 52 29	54 44 29	54 36 29	54 28 29		18
45		55 38 28	55 30 28	55 21 28	55 13 28	55 5 28	54 56 28		15
48		56 6 28	55 58 28	55 49 28	55 41 28	55 33 27	55 24 27		12
9	51	+56 34 27	+56 26 27	+56 17 27	+56 9 27	+56 0 27	+55 51 27	14	9
54		57 1 27	56 53 26	56 44 27	56 36 26	56 27 26	56 18 27		6
9	57	57 28 26	57 19 26	57 11 26	57 2 26	56 53 26	56 45 25		3
10	0	57 54 25	57 45 26	57 37 25	57 28 25	57 19 25	57 10 25	14	0
10	3	+58 19 25	+58 11 26	+58 2 25	+57 53 25	+57 44 25	+57 35 25	13	57

TABLE I.

689

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1923.

Decl.		88° 53' 20''		88° 53' 30''		88° 53' 40''		88° 53' 50''		88° 54' 0''		88° 54' 10''		Decl.	
H. A.														H. A.	
h	m													h	m
10	3	+58	19	25	+58	11	25	+57	53	25	+57	44	25	13	57
	6	58	44	25	58	36	25	58	18	25	58	9	25	58	0
	9	59	8	24	59	0	24	58	42	24	58	33	24	58	24
	12	59	32	24	59	23	23	59	14	23	58	56	23	58	47
	15	59	55	23	59	46	22	59	28	22	59	19	22	59	10
10	18	+60	18	23	+60	8	22	+59	50	22	+59	41	22	+59	32
	21	60	40	22	60	30	22	60	12	22	60	3	22	59	54
	24	61	1	21	60	51	21	60	33	21	60	24	21	60	15
	27	61	21	20	61	12	20	61	3	21	60	44	20	60	35
	30	61	41	20	61	32	19	61	14	20	61	4	19	60	55
10	33	+62	1	18	+61	51	19	+61	33	18	+61	23	19	+61	14
	36	62	19	18	62	10	18	61	51	18	61	42	18	61	33
	39	62	37	18	62	28	18	62	9	18	62	0	18	61	51
	42	62	55	17	62	45	17	62	27	18	62	17	17	62	8
	45	63	12	16	63	2	16	62	43	16	62	34	16	62	24
10	48	+63	28	15	+63	18	16	+62	59	16	+62	50	15	+62	40
	51	63	43	15	63	34	15	63	15	16	63	5	15	62	56
	54	63	58	15	63	49	14	63	30	15	63	20	14	63	10
10	57	64	13	13	64	3	14	63	53	14	63	34	14	63	24
11	0	64	26	13	64	17	13	63	57	13	63	48	13	63	38
11	3	+64	39	13	+64	30	12	+64	10	12	+64	1	12	+63	51
	6	64	52	11	64	42	12	64	22	12	64	13	11	64	3
	9	65	3	11	64	54	11	64	34	11	64	24	11	64	14
	12	65	14	11	65	5	10	64	45	10	64	35	10	64	25
	15	65	25	9	65	15	9	64	55	10	64	45	9	64	36
11	18	+65	34	9	+65	24	9	+65	15	9	+64	55	9	+64	45
	21	65	43	9	65	33	8	65	14	8	65	4	8	64	54
	24	65	52	7	65	42	8	65	22	8	65	12	8	65	2
	27	65	59	7	65	50	7	65	30	7	65	20	7	65	10
	30	66	6	7	65	57	6	65	37	6	65	27	6	65	17
11	33	+66	13	6	+66	3	6	+65	53	6	+65	33	6	+65	23
	36	66	19	5	66	9	5	65	59	5	65	39	5	65	29
	39	66	24	4	66	14	4	65	54	4	65	44	4	65	34
	42	66	28	4	66	18	4	65	58	4	65	48	4	65	38
	45	66	32	3	66	22	3	66	12	3	65	52	3	65	42
11	48	+66	35	2	+66	25	2	+66	15	2	+65	55	2	+65	45
	51	66	37	2	66	27	2	66	17	2	65	57	2	65	47
	54	66	39	1	66	29	1	66	19	1	65	59	1	65	49
11	57	66	40	0	66	30	0	66	20	0	66	0	0	65	50
12	0	+66	40	0	+66	30	0	+66	20	0	+66	0	0	+65	50

TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

Altitude.		10°	20°	30°	40°	50°	60°	70°	Altitude.	
H. A.									H. A.	
h	m								h	m
0	12	0	0	0	0	0	0	0	12	24
1	11	-2	-2	-1	0	0	+2	+4	13	23
2	10	8	6	4	-2	+2	7	17	14	22
3	9	16	12	8	3	4	14	34	15	21
4	8	24	18	12	5	6	21	50	16	20
5	7	30	23	15	6	7	26	63	17	19
6	6	-32	-24	-16	-6	+7	+28	+67	18	18

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0 ^h	1 ^h	2 ^h	3 ^h	4 ^h	5 ^h	6 ^h	7 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0 0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1 0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2 0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3 0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4 0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5 0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6 0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7 0.019
8	0 1.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8 0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9 0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10 0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11 0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12 0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13 0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14 0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15 0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16 0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17 0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18 0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19 0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20 0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21 0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22 0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23 0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24 0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25 0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26 0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27 0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28 0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29 0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30 0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31 0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32 0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33 0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34 0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35 0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36 0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37 0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38 0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39 0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40 0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41 0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42 0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 6.022	1 15.851	43 0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44 0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45 0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46 0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47 0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48 0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49 0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50 0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 7.332	1 17.162	51 0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52 0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53 0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54 0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55 0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56 0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57 0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58 0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0 0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1 0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2 0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3 0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4 0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5 0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6 0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7 0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8 0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9 0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10 0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11 0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12 0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13 0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14 0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15 0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16 0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17 0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18 0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19 0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20 0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21 0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22 0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23 0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24 0.066
25	1 22.732	1 32.562	1 42.391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25 0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26 0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27 0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28 0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29 0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30 0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31 0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32 0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33 0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34 0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35 0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36 0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37 0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38 0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39 0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40 0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41 0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42 0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43 0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44 0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45 0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46 0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47 0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48 0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49 0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50 0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51 0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52 0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53 0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54 0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55 0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56 0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57 0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58 0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59 0.161

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0 0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1 0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2 0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3 0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4 0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5 0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6 0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7 0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8 0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9 0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10 0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11 0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12 0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13 0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14 0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15 0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16 0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17 0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18 0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19 0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20 0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21 0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22 0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23 0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24 0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25 0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26 0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27 0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28 0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29 0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30 0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31 0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32 0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33 0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34 0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35 0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36 0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37 0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38 0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39 0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40 0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41 0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42 0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43 0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44 0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45 0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46 0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47 0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48 0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49 0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50 0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51 0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52 0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53 0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54 0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55 0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56 0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57 0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58 0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59 0.161

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0 ^h		1 ^h		2 ^h		3 ^h		4 ^h		5 ^h		6 ^h		7 ^h		For Seconds.	
m	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s	s	s
0	0	0.000	0	9.856	0	19.713	0	29.569	0	39.426	0	49.282	0	59.139	1	8.395	0	0.000
1	0	0.164	0	10.021	0	19.877	0	29.734	0	39.590	0	49.447	0	59.303	1	9.160	1	0.003
2	0	0.329	0	10.185	0	20.041	0	29.898	0	39.754	0	49.611	0	59.467	1	9.324	2	0.005
3	0	0.493	0	10.349	0	20.206	0	30.062	0	39.919	0	49.775	0	59.632	1	9.488	3	0.008
4	0	0.657	0	10.514	0	20.370	0	30.227	0	40.083	0	49.939	0	59.796	1	9.652	4	0.011
5	0	0.821	0	10.678	0	20.534	0	30.391	0	40.247	0	50.104	0	59.960	1	9.817	5	0.014
6	0	0.986	0	10.842	0	20.699	0	30.555	0	40.412	0	50.268	1	0.124	1	9.981	6	0.016
7	0	1.150	0	11.006	0	20.863	0	30.719	0	40.576	0	50.432	1	0.289	1	10.145	7	0.019
8	0	1.314	0	11.171	0	21.027	0	30.884	0	40.740	0	50.597	1	0.453	1	10.310	8	0.022
9	0	1.478	0	11.335	0	21.191	0	31.048	0	40.904	0	50.761	1	0.617	1	10.474	9	0.025
10	0	1.643	0	11.499	0	21.356	0	31.212	0	41.069	0	50.925	1	0.782	1	10.638	10	0.027
11	0	1.807	0	11.663	0	21.520	0	31.376	0	41.233	0	51.089	1	0.946	1	10.802	11	0.030
12	0	1.971	0	11.828	0	21.684	0	31.541	0	41.397	0	51.254	1	1.110	1	10.967	12	0.033
13	0	2.136	0	11.992	0	21.849	0	31.705	0	41.561	0	51.418	1	1.274	1	11.131	13	0.036
14	0	2.300	0	12.156	0	22.013	0	31.869	0	41.726	0	51.582	1	1.439	1	11.295	14	0.038
15	0	2.464	0	12.321	0	22.177	0	32.034	0	41.890	0	51.746	1	1.603	1	11.459	15	0.041
16	0	2.628	0	12.485	0	22.341	0	32.198	0	42.054	0	51.911	1	1.767	1	11.624	16	0.044
17	0	2.793	0	12.649	0	22.506	0	32.362	0	42.219	0	52.075	1	1.932	1	11.788	17	0.047
18	0	2.957	0	12.813	0	22.670	0	32.526	0	42.383	0	52.239	1	2.096	1	11.952	18	0.049
19	0	3.121	0	12.978	0	22.834	0	32.691	0	42.547	0	52.404	1	2.260	1	12.117	19	0.052
20	0	3.285	0	13.142	0	22.998	0	32.855	0	42.711	0	52.568	1	2.424	1	12.281	20	0.055
21	0	3.450	0	13.306	0	23.163	0	33.019	0	42.876	0	52.732	1	2.589	1	12.445	21	0.057
22	0	3.614	0	13.471	0	23.327	0	33.183	0	43.040	0	52.896	1	2.753	1	12.609	22	0.060
23	0	3.778	0	13.635	0	23.491	0	33.348	0	43.204	0	53.061	1	2.917	1	12.774	23	0.063
24	0	3.943	0	13.799	0	23.656	0	33.512	0	43.368	0	53.225	1	3.081	1	12.938	24	0.066
25	0	4.107	0	13.963	0	23.820	0	33.676	0	43.533	0	53.389	1	3.246	1	13.102	25	0.068
26	0	4.271	0	14.128	0	23.984	0	33.841	0	43.697	0	53.554	1	3.410	1	13.266	26	0.071
27	0	4.435	0	14.292	0	24.148	0	34.005	0	43.861	0	53.718	1	3.574	1	13.431	27	0.074
28	0	4.600	0	14.456	0	24.313	0	34.169	0	44.026	0	53.882	1	3.739	1	13.595	28	0.077
29	0	4.764	0	14.620	0	24.477	0	34.333	0	44.190	0	54.046	1	3.903	1	13.759	29	0.079
30	0	4.928	0	14.785	0	24.641	0	34.498	0	44.354	0	54.211	1	4.067	1	13.924	30	0.082
31	0	5.093	0	14.949	0	24.805	0	34.662	0	44.518	0	54.375	1	4.231	1	14.088	31	0.085
32	0	5.257	0	15.113	0	24.970	0	34.826	0	44.683	0	54.539	1	4.396	1	14.252	32	0.088
33	0	5.421	0	15.278	0	25.134	0	34.990	0	44.847	0	54.703	1	4.560	1	14.416	33	0.090
34	0	5.585	0	15.442	0	25.298	0	35.155	0	45.011	0	54.868	1	4.724	1	14.581	34	0.093
35	0	5.750	0	15.606	0	25.463	0	35.319	0	45.176	0	55.032	1	4.888	1	14.745	35	0.096
36	0	5.914	0	15.770	0	25.627	0	35.483	0	45.340	0	55.196	1	5.053	1	14.909	36	0.099
37	0	6.078	0	15.935	0	25.791	0	35.648	0	45.504	0	55.361	1	5.217	1	15.073	37	0.101
38	0	6.242	0	16.099	0	25.955	0	35.812	0	45.668	0	55.525	1	5.381	1	15.238	38	0.104
39	0	6.407	0	16.263	0	26.120	0	35.976	0	45.833	0	55.689	1	5.546	1	15.402	39	0.107
40	0	6.571	0	16.427	0	26.284	0	36.140	0	45.997	0	55.853	1	5.710	1	15.566	40	0.110
41	0	6.735	0	16.592	0	26.448	0	36.305	0	46.161	0	56.018	1	5.874	1	15.731	41	0.112
42	0	6.900	0	16.756	0	26.612	0	36.469	0	46.325	0	56.182	1	6.038	1	15.895	42	0.115
43	0	7.064	0	16.920	0	26.777	0	36.633	0	46.490	0	56.346	1	6.203	1	16.059	43	0.118
44	0	7.228	0	17.085	0	26.941	0	36.798	0	46.654	0	56.510	1	6.367	1	16.223	44	0.120
45	0	7.392	0	17.249	0	27.105	0	36.962	0	46.818	0	56.675	1	6.531	1	16.388	45	0.123
46	0	7.557	0	17.413	0	27.270	0	37.126	0	46.983	0	56.839	1	6.695	1	16.552	46	0.126
47	0	7.721	0	17.577	0	27.434	0	37.290	0	47.147	0	57.003	1	6.860	1	16.716	47	0.129
48	0	7.885	0	17.742	0	27.598	0	37.455	0	47.311	0	57.168	1	7.024	1	16.881	48	0.131
49	0	8.049	0	17.906	0	27.762	0	37.619	0	47.475	0	57.332	1	7.188	1	17.045	49	0.134
50	0	8.214	0	18.070	0	27.927	0	37.783	0	47.640	0	57.496	1	7.353	1	17.209	50	0.137
51	0	8.378	0	18.234	0	28.091	0	37.947	0	47.804	0	57.660	1	7.517	1	17.373	51	0.140
52	0	8.542	0	18.399	0	28.255	0	38.112	0	47.968	0	57.825	1	7.681	1	17.538	52	0.142
53	0	8.707	0	18.563	0	28.420	0	38.276	0	48.132	0	57.989	1	7.845	1	17.702	53	0.145
54	0	8.871	0	18.727	0	28.584	0	38.440	0	48.297	0	58.153	1	8.010	1	17.866	54	0.148
55	0	9.035	0	18.892	0	28.748	0	38.605	0	48.461	0	58.317	1	8.174	1	18.030	55	0.151
56	0	9.199	0	19.056	0	28.912	0	38.769	0	48.625	0	58.482	1	8.338	1	18.195	56	0.153
57	0	9.364	0	19.220	0	29.077	0	38.933	0	48.790	0	58.646	1	8.502	1	18.359	57	0.156
58	0	9.528	0	19.384	0	29.241	0	39.097	0	48.954	0	58.810	1	8.667	1	18.523	58	0.159
59	0	9.692	0	19.549	0	29.405	0	39.262	0	49.118	0	58.975	1	8.831	1	18.688	59	0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8 ^h	9 ^h	10 ^h	11 ^h	12 ^h	13 ^h	14 ^h	15 ^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0.057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33.308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35.732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16 ^h	17 ^h	18 ^h	19 ^h	20 ^h	21 ^h	22 ^h	23 ^h	For Seconds.
m	m s	m s	m s	m s	m s	m s	m s	m s	s s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0 0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1 0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2 0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3 0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4 0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5 0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6 0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7 0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8 0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9 0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10 0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11 0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12 0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13 0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14 0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15 0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16 0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17 0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18 0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19 0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20 0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21 0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22 0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23 0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24 0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25 0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26 0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27 0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28 0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29 0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30 0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31 0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32 0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33 0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34 0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35 0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36 0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37 0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38 0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39 0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40 0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41 0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42 0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43 0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44 0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45 0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46 0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47 0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48 0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49 0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50 0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51 0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52 0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53 0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54 0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55 0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56 0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57 0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58 0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59 0.162

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

H. A.	Lat.	10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat.	H. A.
	h m	° '	° '	° '	° '	° '	° '	° '	° '	° '	h m	
0	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24	0
	10	0 3.0	0 3.0	0 3.1	0 3.2	0 3.2	0 3.3	0 3.3	0 3.4	0 3.5	23	50
	20	0 5.9	0 6.0	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.8	0 6.9		40
0	30	0 8.8	0 9.0	0 9.3	0 9.4	0 9.6	0 9.7	0 9.9	0 10.1	0 10.3	23	30
	40	0 11.7	0 12.0	0 12.3	0 12.5	0 12.7	0 12.9	0 13.2	0 13.4	0 13.8		20
	50	0 14.6	0 14.9	0 15.4	0 15.6	0 15.8	0 16.1	0 16.4	0 16.8	0 17.1		10
1	0	0 17.5	0 17.9	0 18.4	0 18.7	0 19.0	0 19.3	0 19.6	0 20.0	0 20.5	23	0
	10	0 20.3	0 20.8	0 21.4	0 21.7	0 22.0	0 22.4	0 22.8	0 23.3	0 23.8	22	50
	20	0 23.1	0 23.6	0 24.5	0 24.7	0 25.0	0 25.5	0 26.0	0 26.5	0 27.1		40
1	30	0 25.9	0 26.4	0 27.3	0 27.6	0 28.0	0 28.5	0 29.0	0 29.6	0 30.3	22	30
	40	0 28.6	0 29.2	0 30.0	0 30.5	0 30.9	0 31.5	0 32.1	0 32.7	0 33.4		20
	50	0 31.2	0 31.9	0 32.8	0 33.3	0 33.8	0 34.4	0 35.0	0 35.7	0 36.5		10
2	0	0 33.8	0 34.5	0 35.5	0 36.0	0 36.6	0 37.2	0 37.9	0 38.7	0 39.5	22	0
	10	0 36.3	0 37.1	0 38.2	0 38.7	0 39.3	0 40.0	0 40.7	0 41.6	0 42.5	21	50
	20	0 38.7	0 39.6	0 40.7	0 41.3	0 42.0	0 42.7	0 43.4	0 44.4	0 45.3		40
2	30	0 41.1	0 42.0	0 43.2	0 43.8	0 44.5	0 45.3	0 46.1	0 47.0	0 48.1	21	30
	40	0 43.4	0 44.3	0 45.6	0 46.3	0 47.0	0 47.8	0 48.7	0 49.7	0 50.8		20
	50	0 45.6	0 46.6	0 48.0	0 48.6	0 49.4	0 50.2	0 51.2	0 52.2	0 53.3		10
3	0	0 47.8	0 48.8	0 50.2	0 50.9	0 51.7	0 52.5	0 53.5	0 54.6	0 55.8	21	0
	10	0 49.8	0 50.8	0 52.3	0 53.0	0 53.8	0 54.8	0 55.8	0 56.9	0 58.1	20	50
	20	0 51.7	0 52.8	0 54.3	0 55.1	0 55.9	0 56.8	0 57.9	0 59.1	1 0.4		40
3	30	0 53.6	0 54.7	0 56.2	0 57.0	0 57.9	0 58.9	1 0.0	1 1.2	1 2.5	20	30
	40	0 55.3	0 56.4	0 58.1	0 58.9	0 59.8	1 0.8	1 1.9	1 3.1	1 4.5		20
	50	0 56.9	0 58.1	0 59.8	1 0.6	1 1.5	1 2.6	1 3.7	1 5.0	1 6.4		10
4	0	0 58.4	0 59.6	1 1.3	1 2.2	1 3.2	1 4.2	1 5.4	1 6.7	1 8.2	20	0
	10	0 59.8	1 1.1	1 2.8	1 3.7	1 4.7	1 5.8	1 7.0	1 8.3	1 9.8	19	50
	20	1 1.1	1 2.4	1 4.2	1 5.0	1 6.0	1 7.2	1 8.4	1 9.7	1 11.2		40
4	30	1 2.3	1 3.6	1 5.4	1 6.3	1 7.3	1 8.4	1 9.7	1 11.1	1 12.6	19	30
	40	1 3.4	1 4.6	1 6.5	1 7.4	1 8.4	1 9.6	1 10.8	1 12.3	1 13.8		20
	50	1 4.3	1 5.6	1 7.5	1 8.4	1 9.4	1 10.6	1 11.9	1 13.3	1 14.9		10
5	0	1 5.1	1 6.4	1 8.3	1 9.2	1 10.3	1 11.5	1 12.8	1 14.2	1 15.8	19	0
	10	1 5.8	1 7.1	1 9.0	1 10.0	1 11.0	1 12.2	1 13.5	1 15.0	1 16.6	18	50
	20	1 6.4	1 7.7	1 9.6	1 10.6	1 11.6	1 12.8	1 14.1	1 15.6	1 17.2		40
5	30	1 6.8	1 8.1	1 10.0	1 11.0	1 12.1	1 13.3	1 14.6	1 16.0	1 17.7	18	30
	40	1 7.1	1 8.4	1 10.4	1 11.3	1 12.4	1 13.6	1 14.9	1 16.4	1 18.0		20
	50	1 7.3	1 8.6	1 10.5	1 11.5	1 12.6	1 13.8	1 15.1	1 16.6	1 18.2		10
6	0	1 7.4	1 8.7	1 10.6	1 11.5	1 12.6	1 13.8	1 15.1	1 16.6	1 18.2	18	0
	10	1 7.3	1 8.6	1 10.5	1 11.4	1 12.5	1 13.7	1 15.0	1 16.5	1 18.1	17	50
	20	1 7.1	1 8.4	1 10.3	1 11.2	1 12.3	1 13.5	1 14.8	1 16.2	1 17.8		40
6	30	1 6.8	1 8.0	1 9.9	1 10.9	1 11.9	1 13.1	1 14.4	1 15.8	1 17.4	17	30
	40	1 6.3	1 7.6	1 9.4	1 10.4	1 11.4	1 12.6	1 13.8	1 15.3	1 16.9		20
	50	1 5.7	1 7.0	1 8.8	1 9.7	1 10.8	1 11.9	1 13.2	1 14.6	1 16.2		10
7	0	1 5.0	1 6.2	1 8.1	1 9.0	1 10.0	1 11.1	1 12.4	1 13.8	1 15.3	17	0
	10	1 4.2	1 5.4	1 7.2	1 8.1	1 9.1	1 10.2	1 11.4	1 12.8	1 14.4	16	50
	20	1 3.2	1 4.4	1 6.2	1 7.0	1 8.1	1 9.1	1 10.4	1 11.7	1 13.2		40
7	30	1 2.1	1 3.3	1 5.0	1 5.9	1 6.9	1 8.0	1 9.1	1 10.5	1 11.9	16	30
	40	1 0.9	1 2.1	1 3.7	1 4.6	1 5.6	1 6.6	1 7.8	1 9.1	1 10.5		20
	50	0 59.6	1 0.8	1 2.4	1 3.2	1 4.2	1 5.2	1 6.3	1 7.6	1 9.0		10
8	0	0 58.2	0 59.3	1 0.9	1 1.7	1 2.6	1 3.6	1 4.7	1 6.0	1 7.3	16	0
	10	0 56.7	0 57.8	0 59.3	1 0.1	1 1.0	1 1.9	1 3.0	1 4.2	1 5.5	15	50
	20	0 55.1	0 56.1	0 57.6	0 58.4	0 59.2	1 0.1	1 1.2	1 2.4	1 3.6		40
8	30	0 53.3	0 54.3	0 55.8	0 56.5	0 57.4	0 58.2	0 59.2	1 0.4	1 1.6	15	30
	40	0 51.5	0 52.4	0 53.8	0 54.5	0 55.3	0 56.2	0 57.2	0 58.3	0 59.5		20
	50	0 49.6	0 50.5	0 51.8	0 52.5	0 53.2	0 54.1	0 55.0	0 56.1	0 57.2		10
9	0	0 47.5	0 48.4	0 49.7	0 50.3	0 51.0	0 51.8	0 52.7	0 53.8	0 54.8	15	0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.		10°	15°	20°	22°	24°	26°	28°	30°	32°	Lat. H. A.	
h m	° /	° /	° /	° /	° /	° /	° /	° /	° /	° /	h m	° /
9 0	0 47.5	0 48.4	0 49.7	0 50.3	0 51.0	0 51.8	0 52.7	0 53.8	0 54.8	15 0	0 47.5	
10	0 45.4	0 46.2	0 47.4	0 48.1	0 48.8	0 49.5	0 50.4	0 51.3	0 52.4	14 50	0 45.4	
20	0 43.2	0 44.0	0 45.1	0 45.7	0 46.4	0 47.1	0 47.9	0 48.8	0 49.8	40	0 43.2	
9 30	0 40.9	0 41.6	0 42.7	0 43.3	0 43.9	0 44.6	0 45.3	0 46.2	0 47.2	14 30	0 40.9	
40	0 38.5	0 39.2	0 40.3	0 40.8	0 41.4	0 42.0	0 42.7	0 43.5	0 44.4	20	0 38.5	
50	0 36.1	0 36.7	0 37.7	0 38.2	0 38.8	0 39.3	0 40.0	0 40.8	0 41.6	10	0 36.1	
10 0	0 33.6	0 34.2	0 35.1	0 35.5	0 36.0	0 36.6	0 37.2	0 37.9	0 38.7	14 0	0 33.6	
10	0 31.0	0 31.6	0 32.4	0 32.8	0 33.3	0 33.8	0 34.4	0 35.0	0 35.7	13 50	0 31.0	
20	0 28.4	0 28.9	0 29.6	0 30.0	0 30.5	0 30.9	0 31.5	0 32.0	0 32.7	40	0 28.4	
10 30	0 25.7	0 26.2	0 26.8	0 27.2	0 27.6	0 28.0	0 28.5	0 29.0	0 29.6	13 30	0 25.7	
40	0 23.0	0 23.4	0 24.0	0 24.3	0 24.6	0 25.0	0 25.5	0 25.9	0 26.5	20	0 23.0	
50	0 20.2	0 20.6	0 21.1	0 21.4	0 21.7	0 22.0	0 22.4	0 22.8	0 23.3	10	0 20.2	
11 0	0 17.4	0 17.7	0 18.2	0 18.4	0 18.6	0 18.9	0 19.2	0 19.6	0 20.0	13 0	0 17.4	
10	0 14.5	0 14.8	0 15.2	0 15.4	0 15.6	0 15.8	0 16.1	0 16.4	0 16.7	12 50	0 14.5	
20	0 11.7	0 11.9	0 12.2	0 12.3	0 12.5	0 12.7	0 12.9	0 13.2	0 13.4	40	0 11.7	
11 30	0 8.8	0 8.9	0 9.1	0 9.3	0 9.4	0 9.5	0 9.7	0 9.9	0 10.1	12 30	0 8.8	
40	0 5.9	0 6.0	0 6.1	0 6.2	0 6.3	0 6.4	0 6.5	0 6.6	0 6.7	20	0 5.9	
50	0 2.9	0 3.0	0 3.1	0 3.1	0 3.1	0 3.2	0 3.2	0 3.3	0 3.4	10	0 2.9	
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0	0 0.0	

Lat. H. A.		32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H. A.	
h m	° /	° /	° /	° /	° /	° /	° /	° /	° /	° /	h m	° /
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	0 0.0
10	0 3.5	0 3.5	0 3.6	0 3.7	0 3.8	0 4.0	0 4.1	0 4.3	0 4.4	23 50	0 3.5	
20	0 6.9	0 7.1	0 7.2	0 7.4	0 7.7	0 7.9	0 8.2	0 8.5	0 8.8	40	0 6.9	
0 30	0 10.3	0 10.6	0 10.9	0 11.2	0 11.5	0 11.8	0 12.3	0 12.7	0 13.2	23 30	0 10.3	
40	0 13.8	0 14.1	0 14.4	0 14.8	0 15.3	0 15.8	0 16.3	0 16.9	0 17.6	20	0 13.8	
50	0 17.1	0 17.5	0 18.0	0 18.5	0 19.0	0 19.6	0 20.3	0 21.2	0 21.9	10	0 17.1	
1 0	0 20.5	0 21.0	0 21.5	0 22.1	0 22.8	0 23.5	0 24.3	0 25.2	0 26.2	23 0	0 20.5	
10	0 23.8	0 24.4	0 25.0	0 25.7	0 26.4	0 27.3	0 28.2	0 29.3	0 30.4	22 50	0 23.8	
20	0 27.1	0 27.7	0 28.4	0 29.2	0 30.1	0 31.0	0 32.1	0 33.3	0 34.6	40	0 27.1	
1 30	0 30.3	0 31.0	0 31.8	0 32.7	0 33.6	0 34.7	0 35.9	0 37.2	0 38.7	22 30	0 30.3	
40	0 33.4	0 34.2	0 35.1	0 36.1	0 37.1	0 38.3	0 39.6	0 41.1	0 42.7	20	0 33.4	
50	0 36.5	0 37.4	0 38.3	0 39.4	0 40.6	0 41.9	0 43.3	0 44.9	0 46.7	10	0 36.5	
2 0	0 39.5	0 40.5	0 41.5	0 42.6	0 43.9	0 45.3	0 46.9	0 48.6	0 50.5	22 0	0 39.5	
10	0 42.5	0 43.5	0 44.6	0 45.8	0 47.2	0 48.7	0 50.4	0 52.2	0 54.2	21 50	0 42.5	
20	0 45.3	0 46.4	0 47.6	0 48.9	0 50.3	0 51.9	0 53.7	0 55.7	0 57.9	40	0 45.3	
2 30	0 48.1	0 49.2	0 50.5	0 51.9	0 53.4	0 55.1	0 57.0	0 59.1	1 1.4	21 30	0 48.1	
40	0 50.8	0 52.0	0 53.3	0 54.8	0 56.4	0 58.2	1 0.1	1 2.3	1 4.8	20	0 50.8	
50	0 53.3	0 54.6	0 56.0	0 57.5	0 59.2	1 1.1	1 3.2	1 5.5	1 8.0	10	0 53.3	
3 0	0 55.8	0 57.1	0 58.6	1 0.2	1 1.9	1 3.9	1 6.1	1 8.5	1 11.2	21 0	0 55.8	
10	0 58.1	0 59.5	1 1.0	1 2.7	1 4.5	1 6.6	1 8.8	1 11.4	1 14.2	20 50	0 58.1	
20	1 0.4	1 1.8	1 3.4	1 5.1	1 7.0	1 9.1	1 11.5	1 14.1	1 17.0	40	1 0.4	
3 30	1 2.5	1 4.0	1 5.6	1 7.4	1 9.4	1 11.6	1 14.0	1 16.7	1 19.7	20 30	1 2.5	
40	1 4.5	1 6.0	1 7.7	1 9.6	1 11.6	1 13.8	1 16.4	1 19.1	1 22.2	20	1 4.5	
50	1 6.4	1 8.0	1 9.7	1 11.6	1 13.6	1 16.0	1 18.5	1 21.4	1 24.6	10	1 6.4	
4 0	1 8.2	1 9.8	1 11.5	1 13.4	1 15.6	1 18.0	1 20.6	1 23.5	1 26.8	20 0	1 8.2	
10	1 9.8	1 11.4	1 13.2	1 15.2	1 17.4	1 19.8	1 22.5	1 25.5	1 28.8	19 50	1 9.8	
20	1 11.2	1 12.9	1 14.7	1 16.8	1 19.0	1 21.5	1 24.2	1 27.3	1 30.7	40	1 11.2	
4 30	1 12.6	1 14.3	1 16.2	1 18.2	1 20.5	1 23.0	1 25.8	1 28.9	1 32.3	19 30	1 12.6	
40	1 13.8	1 15.5	1 17.4	1 19.5	1 21.8	1 24.4	1 27.2	1 30.3	1 33.8	20	1 13.8	
50	1 14.9	1 16.6	1 18.5	1 20.6	1 23.0	1 25.6	1 28.4	1 31.6	1 35.2	10	1 14.9	
5 0	1 15.8	1 17.5	1 19.5	1 21.6	1 24.0	1 26.6	1 29.5	1 32.7	1 36.3	19 0	1 15.8	

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat. H. A.		32°	34°	36°	38°	40°	42°	44°	46°	48°	Lat. H. A.	
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	° ' "
5 0	1 15.8	1 17.5	1 19.5	1 21.6	1 24.0	1 26.6	1 29.5	1 32.7	1 36.3	1 39.0	19 0	1 15.8
10	1 16.6	1 18.3	1 20.3	1 22.4	1 24.8	1 27.5	1 30.4	1 33.6	1 37.2	1 40.0	18 50	1 16.6
20	1 17.2	1 19.0	1 21.0	1 23.1	1 25.5	1 28.2	1 31.1	1 34.4	1 38.0	1 41.0	18 40	1 17.2
5 30	1 17.7	1 19.5	1 21.4	1 23.6	1 26.0	1 28.7	1 31.6	1 34.9	1 38.5	1 41.5	18 30	1 17.7
40	1 18.0	1 19.8	1 21.8	1 24.0	1 26.4	1 29.0	1 32.0	1 35.3	1 38.9	1 42.0	18 20	1 18.0
50	1 18.2	1 20.0	1 22.0	1 24.1	1 26.6	1 29.2	1 32.2	1 35.5	1 39.1	1 42.5	18 10	1 18.2
6 0	1 18.2	1 20.0	1 22.0	1 24.2	1 26.6	1 29.3	1 32.2	1 35.5	1 39.1	1 42.5	18 0	1 18.2
10	1 18.1	1 19.9	1 21.8	1 24.0	1 26.4	1 29.1	1 32.0	1 35.3	1 38.9	1 42.0	17 50	1 18.1
20	1 17.8	1 19.6	1 21.6	1 23.7	1 26.1	1 28.8	1 31.7	1 35.0	1 38.5	1 41.5	17 40	1 17.8
6 30	1 17.4	1 19.2	1 21.1	1 23.3	1 25.7	1 28.3	1 31.2	1 34.4	1 38.0	1 41.0	17 30	1 17.4
40	1 16.9	1 18.6	1 20.6	1 22.7	1 25.0	1 27.6	1 30.5	1 33.7	1 37.2	1 40.0	17 20	1 16.9
50	1 16.2	1 17.9	1 19.8	1 21.9	1 24.2	1 26.8	1 29.7	1 32.8	1 36.3	1 39.0	17 10	1 16.2
7 0	1 15.3	1 17.0	1 18.9	1 21.0	1 23.3	1 25.8	1 28.6	1 31.8	1 35.2	1 38.0	17 0	1 15.3
10	1 14.4	1 16.0	1 17.9	1 19.9	1 22.2	1 24.7	1 27.4	1 30.5	1 33.9	1 36.5	16 50	1 14.4
20	1 13.2	1 14.8	1 16.7	1 18.6	1 20.9	1 23.4	1 26.1	1 29.1	1 32.5	1 35.0	16 40	1 13.2
7 30	1 11.9	1 13.6	1 15.4	1 17.3	1 19.5	1 21.9	1 24.6	1 27.5	1 30.8	1 33.0	16 30	1 11.9
40	1 10.5	1 12.1	1 13.9	1 15.8	1 17.9	1 20.3	1 22.9	1 25.8	1 29.0	1 31.0	16 20	1 10.5
50	1 9.0	1 10.5	1 12.3	1 14.2	1 16.2	1 18.5	1 21.1	1 23.9	1 27.0	1 29.0	16 10	1 9.0
8 0	1 7.3	1 8.8	1 10.5	1 12.4	1 14.4	1 16.6	1 19.1	1 21.9	1 24.9	1 27.0	16 0	1 7.3
10	1 5.5	1 7.0	1 8.6	1 10.4	1 12.4	1 14.6	1 17.0	1 19.7	1 22.6	1 24.0	15 50	1 5.5
20	1 3.6	1 5.1	1 6.6	1 8.4	1 10.3	1 12.4	1 14.7	1 17.3	1 20.2	1 22.0	15 40	1 3.6
8 30	1 1.6	1 3.0	1 4.5	1 6.2	1 8.0	1 10.1	1 12.3	1 14.8	1 17.6	1 20.0	15 30	1 1.6
40	0 59.5	1 0.8	1 2.2	1 3.9	1 5.6	1 7.6	1 9.8	1 12.2	1 14.9	1 17.0	15 20	0 59.5
50	0 57.2	0 58.5	0 59.9	1 1.4	1 3.2	1 5.1	1 7.2	1 9.5	1 12.0	1 14.0	15 10	0 57.2
9 0	0 54.8	0 56.1	0 57.4	0 58.9	1 0.5	1 2.4	1 4.4	1 6.6	1 9.0	1 11.0	15 0	0 54.8
10	0 52.4	0 53.6	0 54.8	0 56.2	0 57.8	0 59.5	1 1.5	1 3.6	1 5.9	1 8.0	14 50	0 52.4
20	0 49.8	0 51.0	0 52.1	0 53.5	0 55.0	0 56.6	0 58.4	1 0.5	1 2.7	1 4.0	14 40	0 49.8
9 30	0 47.2	0 48.2	0 49.4	0 50.6	0 52.0	0 53.6	0 55.3	0 57.2	0 59.3	1 1.0	14 30	0 47.2
40	0 44.4	0 45.4	0 46.5	0 47.7	0 49.0	0 50.5	0 52.1	0 53.9	0 55.9	1 1.0	14 20	0 44.4
50	0 41.6	0 42.5	0 43.6	0 44.7	0 45.9	0 47.3	0 48.8	0 50.4	0 52.3	1 1.0	14 10	0 41.6
10 0	0 38.7	0 39.6	0 40.5	0 41.6	0 42.7	0 44.0	0 45.4	0 46.9	0 48.7	1 1.0	14 0	0 38.7
10	0 35.7	0 36.5	0 37.4	0 38.4	0 39.4	0 40.6	0 41.9	0 43.3	0 44.9	1 1.0	13 50	0 35.7
20	0 32.7	0 33.4	0 34.2	0 35.1	0 36.1	0 37.2	0 38.3	0 39.6	0 41.1	1 1.0	13 40	0 32.7
10 30	0 29.6	0 30.3	0 31.0	0 31.8	0 32.6	0 33.6	0 34.7	0 35.9	0 37.2	1 1.0	13 30	0 29.6
40	0 26.5	0 27.0	0 27.7	0 28.4	0 29.2	0 30.0	0 31.0	0 32.0	0 33.2	1 1.0	13 20	0 26.5
50	0 23.3	0 23.8	0 24.3	0 25.0	0 25.6	0 26.4	0 27.2	0 28.2	0 29.2	1 1.0	13 10	0 23.3
11 0	0 20.0	0 20.4	0 20.9	0 21.5	0 22.1	0 22.7	0 23.4	0 24.2	0 25.1	1 1.0	13 0	0 20.0
10	0 16.7	0 17.1	0 17.5	0 18.0	0 18.4	0 19.0	0 19.6	0 20.3	0 21.0	1 1.0	12 50	0 16.7
20	0 13.4	0 13.7	0 14.0	0 14.4	0 14.8	0 15.2	0 15.7	0 16.3	0 16.9	1 1.0	12 40	0 13.4
11 30	0 10.1	0 10.3	0 10.6	0 10.8	0 11.1	0 11.5	0 11.8	0 12.2	0 12.7	1 1.0	12 30	0 10.1
40	0 6.7	0 6.9	0 7.0	0 7.2	0 7.4	0 7.6	0 7.9	0 8.2	0 8.5	1 1.0	12 20	0 6.7
50	0 3.4	0 3.4	0 3.5	0 3.6	0 3.7	0 3.8	0 4.0	0 4.1	0 4.2	1 1.0	12 10	0 3.4
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	1 1.0	12 0	0 0.0

Lat. H. A.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat. H. A.	
h m	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	h m	° ' "
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	0 0.0
10	0 4.4	0 4.6	0 4.8	0 5.1	0 5.3	0 5.6	0 6.0	0 6.2	0 6.4	0 6.4	23 50	0 4.4
20	0 8.8	0 9.2	0 9.6	0 10.1	0 10.6	0 11.3	0 12.0	0 12.4	0 12.8	0 12.8	23 40	0 8.8
0 30	0 13.2	0 13.8	0 14.4	0 15.1	0 15.9	0 16.9	0 17.9	0 18.5	0 19.1	0 19.1	23 30	0 13.2
40	0 17.6	0 18.3	0 19.2	0 20.1	0 21.2	0 22.4	0 23.8	0 24.6	0 25.4	0 25.4	23 20	0 17.6
50	0 21.9	0 22.8	0 23.9	0 25.1	0 26.4	0 27.9	0 29.7	0 30.6	0 31.7	0 31.7	23 10	0 21.9
1 0	0 26.2	0 27.3	0 28.6	0 30.0	0 31.6	0 33.4	0 35.5	0 36.6	0 37.9	0 37.9	23 0	0 26.2

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat.		
H. A.											H. A.		
h	m	°	'	°	'	°	'	°	'	°	'	h	m
1	0	0 26.2	0 27.3	0 28.6	0 30.0	0 31.6	0 33.4	0 35.5	0 36.6	0 37.9		23	0
	10	0 30.4	0 31.7	0 33.2	0 34.8	0 36.7	0 38.8	0 41.2	0 42.6	0 44.0		22	50
	20	0 34.6	0 36.1	0 37.7	0 39.6	0 41.7	0 44.1	0 46.8	0 48.4	0 50.0			40
1	30	0 38.7	0 40.4	0 42.2	0 44.3	0 46.6	0 49.3	0 52.4	0 54.1	0 56.0		22	30
	40	0 42.7	0 44.5	0 46.6	0 48.9	0 51.5	0 54.4	0 57.8	0 59.7	1 1.8			20
	50	0 46.7	0 48.6	0 50.9	0 53.4	0 56.2	0 59.4	1 3.1	1 5.2	1 7.4			10
2	0	0 50.5	0 52.6	0 55.0	0 57.8	1 0.8	1 4.3	1 8.3	1 10.5	1 12.9		22	0
	10	0 54.2	0 56.6	0 59.1	1 2.0	1 5.3	1 9.0	1 13.3	1 15.7	1 18.3		21	50
	20	0 57.9	1 0.3	1 3.1	1 6.2	1 9.7	1 13.6	1 18.2	1 20.8	1 23.5			40
2	30	1 1.4	1 4.0	1 6.9	1 10.1	1 13.9	1 18.1	1 23.0	1 25.6	1 28.6		21	30
	40	1 4.8	1 7.5	1 10.6	1 14.1	1 18.0	1 22.4	1 27.5	1 30.3	1 33.4			20
	50	1 8.0	1 10.9	1 14.1	1 17.8	1 21.8	1 26.5	1 31.9	1 34.8	1 38.1			10
3	0	1 11.2	1 14.2	1 17.5	1 21.3	1 25.6	1 30.5	1 36.1	1 39.2	1 42.5		21	0
	10	1 14.2	1 17.3	1 20.8	1 24.7	1 29.2	1 34.2	1 40.1	1 43.3	1 46.8		20	50
	20	1 17.0	1 20.2	1 23.9	1 27.9	1 32.6	1 37.8	1 43.8	1 47.2	1 50.8			40
3	30	1 19.7	1 23.0	1 26.8	1 31.0	1 35.8	1 41.2	1 47.4	1 50.9	1 54.6		20	30
	40	1 22.2	1 25.6	1 29.5	1 33.9	1 38.8	1 44.4	1 50.8	1 54.3	1 58.2			20
	50	1 24.6	1 28.1	1 32.1	1 36.5	1 41.6	1 47.3	1 53.9	1 57.6	2 1.5			10
4	0	1 26.8	1 30.4	1 34.5	1 39.1	1 44.2	1 50.1	1 56.8	2 0.6	2 4.6		20	0
	10	1 28.8	1 32.5	1 36.6	1 41.3	1 46.6	1 52.6	1 59.5	2 3.3	2 7.4		19	50
	20	1 30.7	1 34.4	1 38.6	1 43.4	1 48.8	1 54.9	2 1.9	2 5.8	2 10.0			40
4	30	1 32.3	1 36.2	1 40.5	1 45.3	1 50.8	1 57.0	2 4.1	2 8.1	2 12.3		19	30
	40	1 33.8	1 37.7	1 42.1	1 47.0	1 52.6	1 58.8	2 6.1	2 10.1	2 14.4			20
	50	1 35.2	1 39.1	1 43.5	1 48.5	1 54.1	2 0.5	2 7.8	2 11.8	2 16.2			10
5	0	1 36.3	1 40.3	1 44.7	1 49.8	1 55.4	2 1.8	2 9.2	2 13.3	2 17.7		19	0
	10	1 37.2	1 41.2	1 45.7	1 50.8	1 56.5	2 3.0	2 10.4	2 14.5	2 19.0		18	50
	20	1 38.0	1 42.0	1 46.6	1 51.6	1 57.4	2 3.9	2 11.4	2 15.5	2 20.0			40
5	30	1 38.5	1 42.6	1 47.2	1 52.2	1 58.0	2 4.6	2 12.1	2 16.2	2 20.7		18	30
	40	1 38.9	1 43.0	1 47.6	1 52.6	1 58.4	2 5.0	2 12.5	2 16.7	2 21.1			20
	50	1 39.1	1 43.2	1 47.7	1 52.8	1 58.6	2 5.2	2 12.7	2 16.8	2 21.3			10
6	0	1 39.1	1 43.2	1 47.7	1 52.8	1 58.6	2 5.1	2 12.6	2 16.8	2 21.2		18	0
	10	1 38.9	1 43.0	1 47.5	1 52.6	1 58.3	2 4.9	2 12.3	2 16.4	2 20.9		17	50
	20	1 38.5	1 42.6	1 47.1	1 52.1	1 57.8	2 4.3	2 11.7	2 15.8	2 20.2			40
6	30	1 38.0	1 42.0	1 46.5	1 51.5	1 57.2	2 3.6	2 10.9	2 15.0	2 19.4		17	30
	40	1 37.2	1 41.2	1 45.6	1 50.6	1 56.2	2 2.6	2 9.8	2 13.9	2 18.2			20
	50	1 36.3	1 40.2	1 44.6	1 49.5	1 55.1	2 1.4	2 8.5	2 12.5	2 16.8			10
7	0	1 35.2	1 39.1	1 43.4	1 48.2	1 53.7	1 59.9	2 7.0	2 10.9	2 15.2		17	0
	10	1 33.9	1 37.7	1 42.0	1 46.8	1 52.2	1 58.2	2 5.2	2 9.1	2 13.2		16	50
	20	1 32.5	1 36.2	1 40.4	1 45.1	1 50.4	1 56.4	2 3.2	2 7.0	2 11.1			40
7	30	1 30.8	1 34.5	1 38.6	1 43.2	1 48.4	1 54.3	2 1.0	2 4.7	2 8.7		16	30
	40	1 29.0	1 32.6	1 36.6	1 41.1	1 46.2	1 52.0	1 58.5	2 2.2	2 6.1			20
	50	1 27.0	1 30.6	1 34.5	1 38.9	1 43.8	1 49.4	1 55.9	1 59.4	2 3.2			10
8	0	1 24.9	1 28.3	1 32.2	1 36.4	1 41.3	1 46.7	1 53.0	1 56.4	2 0.1		16	0
	10	1 22.6	1 26.0	1 29.7	1 33.8	1 38.5	1 43.8	1 49.9	1 53.2	1 56.8		15	50
	20	1 20.2	1 23.4	1 27.0	1 31.0	1 35.6	1 40.7	1 46.6	1 49.9	1 53.4			40
8	30	1 17.6	1 20.7	1 24.2	1 28.1	1 32.5	1 37.5	1 43.1	1 46.3	1 49.6		15	30
	40	1 14.9	1 17.9	1 21.2	1 25.0	1 29.2	1 34.0	1 39.5	1 42.5	1 45.8			20
	50	1 12.0	1 14.9	1 18.1	1 21.7	1 25.8	1 30.4	1 35.7	1 38.5	1 41.7			10
9	0	1 9.0	1 11.8	1 14.9	1 18.3	1 22.2	1 26.6	1 31.6	1 34.4	1 37.4		15	0
	10	1 5.9	1 8.6	1 11.5	1 14.8	1 18.5	1 22.7	1 27.4	1 30.1	1 33.0		14	50
	20	1 2.7	1 5.2	1 8.0	1 11.1	1 14.6	1 18.6	1 23.2	1 25.7	1 28.4			40
9	30	0 59.3	1 1.7	1 4.3	1 7.3	1 10.6	1 14.4	1 18.7	1 21.0	1 23.6		14	30
	40	0 55.9	0 58.1	1 0.6	1 3.3	1 6.5	1 10.0	1 14.1	1 16.3	1 18.7			20
	50	0 52.3	0 54.4	0 56.7	0 59.3	1 2.2	1 5.6	1 9.3	1 11.4	1 13.7			10
10	0	0 48.7	0 50.6	0 52.8	0 55.2	0 57.9	1 1.0	1 4.5	1 6.4	1 8.5		14	0

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1923.

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.		48°	50°	52°	54°	56°	58°	60°	61°	62°	Lat.	
H. A.											H. A.	
h m	° /	° /	° /	° /	° /	° /	° /	° /	° /	° /	h m	° /
10 0	0 48.7	0 50.6	0 52.8	0 55.2	0 57.9	1 1.0	1 4.5	1 6.4	1 8.5	14 0	14 0	
10 10	0 44.9	0 46.7	0 48.7	0 50.9	0 53.4	0 56.3	0 59.5	1 1.3	1 3.2	13 50	13 50	
10 20	0 41.1	0 42.7	0 44.6	0 46.6	0 48.9	0 51.5	0 54.4	0 56.1	0 57.8	40	40	
10 30	0 37.2	0 38.7	0 40.3	0 42.2	0 44.2	0 46.6	0 49.2	0 50.7	0 52.3	13 30	13 30	
10 40	0 33.2	0 34.6	0 36.0	0 37.6	0 39.5	0 41.6	0 44.0	0 45.3	0 46.7	20	20	
10 50	0 29.2	0 30.4	0 31.7	0 33.1	0 34.7	0 36.6	0 38.7	0 39.8	0 41.1	10	10	
11 0	0 25.1	0 26.1	0 27.2	0 28.5	0 29.9	0 31.5	0 33.3	0 34.2	0 35.3	13 0	13 0	
11 10	0 21.0	0 21.8	0 22.8	0 23.8	0 25.0	0 26.3	0 27.8	0 28.6	0 29.5	12 50	12 50	
11 20	0 16.9	0 17.5	0 18.3	0 19.1	0 20.0	0 21.1	0 22.3	0 23.0	0 23.7	40	40	
11 30	0 12.7	0 13.2	0 13.7	0 14.4	0 15.0	0 15.9	0 16.8	0 17.3	0 17.8	12 30	12 30	
11 40	0 8.5	0 8.8	0 9.2	0 9.6	0 10.0	0 10.6	0 11.2	0 11.5	0 11.9	20	20	
11 50	0 4.2	0 4.4	0 4.6	0 4.8	0 5.0	0 5.3	0 5.6	0 5.8	0 6.0	10	10	
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0	12 0	

Lat.		62°	63°	64°	65°	66°	67°	68°	69°	70°	Lat.	
H. A.											H. A.	
h m	° /	° /	° /	° /	° /	° /	° /	° /	° /	° /	h m	° /
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0	24 0
0 10	0 6.4	0 6.6	0 6.9	0 7.2	0 7.4	0 7.8	0 8.1	0 8.5	0 8.9	23 50	23 50	
0 20	0 12.8	0 13.2	0 13.7	0 14.3	0 14.9	0 15.5	0 16.2	0 17.0	0 17.8	40	40	
0 30	0 19.1	0 19.8	0 20.6	0 21.4	0 22.2	0 23.2	0 24.3	0 25.4	0 26.7	23 30	23 30	
0 40	0 25.4	0 26.4	0 27.4	0 28.4	0 29.6	0 30.9	0 32.3	0 33.8	0 35.5	20	20	
0 50	0 31.7	0 32.8	0 34.1	0 35.4	0 36.9	0 38.5	0 40.2	0 42.1	0 44.3	10	10	
1 0	0 37.9	0 39.2	0 40.7	0 42.3	0 44.1	0 46.0	0 48.0	0 50.4	0 52.9	23 0	23 0	
1 10	0 44.0	0 45.6	0 47.3	0 49.1	0 51.2	0 53.4	0 55.8	0 58.5	1 1.4	22 50	22 50	
1 20	0 50.0	0 51.8	0 53.8	0 55.8	0 58.2	1 0.7	1 3.4	1 6.4	1 9.8	40	40	
1 30	0 56.0	0 57.9	1 0.1	1 2.4	1 5.0	1 7.8	1 10.9	1 14.3	1 18.0	22 30	22 30	
1 40	1 1.8	1 3.9	1 6.3	1 8.9	1 11.7	1 14.8	1 18.2	1 22.0	1 26.1	20	20	
1 50	1 7.4	1 9.8	1 12.4	1 15.2	1 18.3	1 21.7	1 25.4	1 29.4	1 34.0	10	10	
2 0	1 12.9	1 15.5	1 18.3	1 21.5	1 24.7	1 28.3	1 32.3	1 36.8	1 41.6	22 0	22 0	
2 10	1 18.3	1 21.1	1 24.1	1 27.4	1 30.9	1 34.8	1 39.1	1 43.8	1 49.1	21 50	21 50	
2 20	1 23.5	1 26.5	1 29.7	1 33.2	1 37.0	1 41.1	1 45.7	1 50.7	1 56.3	40	40	
2 30	1 28.6	1 31.7	1 35.1	1 38.8	1 42.8	1 47.2	1 52.0	1 57.3	2 3.2	21 30	21 30	
2 40	1 33.4	1 36.7	1 40.3	1 44.2	1 48.4	1 53.0	1 58.1	2 3.7	2 9.9	20	20	
2 50	1 38.1	1 41.5	1 45.3	1 49.4	1 53.8	1 58.6	2 4.0	2 9.8	2 16.3	10	10	
3 0	1 42.5	1 46.1	1 50.0	1 54.3	1 58.9	2 4.0	2 9.5	2 15.7	2 22.4	21 0	21 0	
3 10	1 46.8	1 50.5	1 54.6	1 59.0	2 3.8	2 9.1	2 14.9	2 21.2	2 28.2	20 50	20 50	
3 20	1 50.8	1 54.7	1 58.9	2 3.5	2 8.5	2 13.9	2 19.9	2 26.5	2 33.7	40	40	
3 30	1 54.6	1 58.6	2 3.0	2 7.7	2 12.8	2 18.5	2 24.6	2 31.4	2 38.9	20 30	20 30	
3 40	1 58.2	2 2.3	2 6.8	2 11.6	2 16.9	2 22.7	2 29.1	2 36.0	2 43.8	20	20	
3 50	2 1.5	2 5.8	2 10.3	2 15.3	2 20.8	2 26.7	2 33.2	2 40.4	2 48.3	10	10	
4 0	2 4.6	2 8.9	2 13.6	2 18.7	2 24.3	2 30.4	2 37.0	2 44.3	2 52.4	20 0	20 0	
4 10	2 7.4	2 11.9	2 16.7	2 21.9	2 27.6	2 33.7	2 40.5	2 48.0	2 56.2	19 50	19 50	
4 20	2 10.0	2 14.5	2 19.4	2 24.7	2 30.5	2 36.8	2 43.7	2 51.3	2 59.7	40	40	
4 30	2 12.3	2 16.9	2 21.9	2 27.3	2 33.1	2 39.5	2 46.5	2 54.2	3 2.8	19 30	19 30	
4 40	2 14.4	2 19.0	2 24.1	2 29.5	2 35.5	2 41.9	2 49.0	2 56.8	3 5.5	20	20	
4 50	2 16.2	2 20.9	2 26.0	2 31.5	2 37.5	2 44.0	2 51.2	2 59.1	3 7.8	10	10	
5 0	2 17.7	2 22.5	2 27.6	2 33.2	2 39.2	2 45.8	2 53.1	3 1.0	3 9.8	19 0	19 0	
5 10	2 19.0	2 23.7	2 28.9	2 34.5	2 40.6	2 47.3	2 54.6	3 2.5	3 11.4	18 50	18 50	
5 20	2 20.0	2 24.8	2 30.0	2 35.6	2 41.7	2 48.4	2 55.7	3 3.7	3 12.6	40	40	
5 30	2 20.7	2 25.5	2 30.7	2 36.4	2 42.5	2 49.2	2 56.5	3 4.6	3 13.4	18 30	18 30	
5 40	2 21.1	2 26.0	2 31.2	2 36.8	2 43.0	2 49.7	2 57.0	3 5.0	3 13.9	20	20	
5 50	2 21.3	2 26.1	2 31.4	2 37.0	2 43.1	2 49.8	2 57.1	3 5.2	3 14.0	10	10	
6 0	2 21.2	2 26.0	2 31.2	2 36.9	2 43.0	2 49.6	2 56.9	3 4.9	3 13.8	18 0	18 0	

[For hour angles 0^h to 12^h the star is west of north, and for hour angles 12^h to 24^h it is east of north.]

Lat.											Lat.		
H. A.		62°	63°	64°	65°	66°	67°	68°	69°	70°	H. A.		
h	m	°	'	°	'	°	'	°	'	°	'	h	m
6	0	2 21.2	2 26.0	2 31.2	2 36.9	2 43.0	2 49.6	2 56.9	3 4.9	3 13.8		18	0
	10	2 20.9	2 25.7	2 30.8	2 36.4	2 42.5	2 49.1	2 56.4	3 4.4	3 13.1		17	50
	20	2 20.2	2 25.0	2 30.2	2 35.7	2 41.8	2 48.3	2 55.5	3 3.4	3 12.2			40
6	30	2 19.4	2 24.1	2 29.2	2 34.7	2 40.7	2 47.2	2 54.3	3 2.2	3 10.8		17	30
	40	2 18.2	2 22.9	2 27.9	2 33.4	2 39.3	2 45.8	2 52.8	3 0.6	3 9.1			20
	50	2 16.8	2 21.4	2 26.4	2 31.8	2 37.6	2 44.0	2 51.0	2 58.6	3 7.0			10
7	0	2 15.2	2 19.7	2 24.6	2 29.9	2 35.7	2 42.0	2 48.8	2 56.4	3 4.6		17	0
	10	2 13.2	2 17.7	2 22.6	2 27.8	2 33.5	2 39.6	2 46.4	2 53.8	3 1.9		16	50
	20	2 11.1	2 15.5	2 20.2	2 25.4	2 31.0	2 37.0	2 43.6	2 50.9	2 58.9			40
7	30	2 8.7	2 13.0	2 17.7	2 22.7	2 28.1	2 34.1	2 40.6	2 47.7	2 55.5		16	30
	40	2 6.1	2 10.3	2 14.8	2 19.8	2 25.1	2 30.9	2 37.2	2 44.2	2 51.8			20
	50	2 3.2	2 7.3	2 11.8	2 16.6	2 21.8	2 27.4	2 33.6	2 40.4	2 47.8			10
8	0	2 0.1	2 4.1	2 8.4	2 13.1	2 18.2	2 23.7	2 29.7	2 36.3	2 43.5		16	0
	10	1 56.8	2 0.7	2 4.9	2 9.4	2 14.4	2 19.7	2 25.5	2 31.9	2 39.0		15	50
	20	1 53.4	1 57.1	2 1.2	2 5.5	2 10.3	2 15.5	2 21.1	2 27.3	2 34.1			40
8	30	1 49.6	1 53.3	1 57.2	2 1.4	2 6.0	2 11.0	2 16.5	2 22.4	2 29.0		15	30
	40	1 45.8	1 49.2	1 53.0	1 57.1	2 1.5	2 6.3	2 11.6	2 17.3	2 23.6			20
	50	1 41.7	1 45.0	1 48.6	1 52.6	1 56.8	2 1.4	2 6.4	2 11.9	2 18.0			10
9	0	1 37.4	1 40.6	1 44.1	1 47.8	1 51.9	1 56.2	2 1.1	2 6.3	2 12.1		15	0
	10	1 33.0	1 36.0	1 39.3	1 42.9	1 46.8	1 50.9	1 55.5	2 0.5	2 6.1		14	50
	20	1 28.4	1 31.3	1 34.4	1 37.8	1 41.4	1 45.4	1 49.8	1 54.5	1 59.8			40
9	30	1 23.6	1 26.3	1 29.3	1 32.5	1 36.0	1 39.7	1 43.8	1 48.3	1 53.3		14	30
	40	1 18.7	1 21.3	1 24.1	1 27.0	1 30.3	1 33.9	1 37.7	1 41.9	1 46.6			20
	50	1 13.7	1 16.1	1 18.7	1 21.4	1 24.5	1 27.8	1 31.4	1 35.4	1 39.7			10
10	0	1 8.5	1 10.7	1 13.1	1 15.7	1 18.6	1 21.6	1 25.0	1 28.7	1 32.7		14	0
	10	1 3.2	1 5.3	1 7.5	1 9.9	1 12.5	1 15.3	1 18.4	1 21.8	1 25.5		13	50
	20	0 57.8	0 59.7	1 1.7	1 3.9	1 6.3	1 8.9	1 11.7	1 14.8	1 18.2			40
10	30	0 52.3	0 54.0	0 55.9	0 57.8	1 0.0	1 2.3	1 4.9	1 7.7	1 10.8		13	30
	40	0 46.7	0 48.3	0 49.9	0 51.6	0 53.6	0 55.7	0 58.0	1 0.4	1 3.2			20
	50	0 41.1	0 42.4	0 43.8	0 45.4	0 47.1	0 48.9	0 50.9	0 53.1	0 55.5			10
11	0	0 35.3	0 36.5	0 37.7	0 39.0	0 40.5	0 42.1	0 43.8	0 45.7	0 47.8		13	0
	10	0 29.5	0 30.5	0 31.5	0 32.6	0 33.9	0 35.2	0 36.6	0 38.2	0 39.9		12	50
	20	0 23.7	0 24.5	0 25.3	0 26.2	0 27.2	0 28.2	0 29.4	0 30.6	0 32.0			40
11	30	0 17.8	0 18.4	0 19.0	0 19.7	0 20.4	0 21.2	0 22.1	0 23.0	0 24.0		12	30
	40	0 11.9	0 12.3	0 12.7	0 13.1	0 13.6	0 14.2	0 14.7	0 15.4	0 16.1			20
	50	0 6.0	0 6.2	0 6.4	0 6.6	0 6.8	0 7.1	0 7.4	0 7.7	0 8.0			10
12	0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0		12	0

Table IV has been computed for a declination of $88^{\circ} 53' 40''$. For other declinations of Polaris the corrections given below should be applied to the Azimuth taken from Table IV.

Azimuth.		0'	20'	40'	60'	80'	100'	120'	140'	160'	180'	200'	Azimuth.
Decl.													Decl.
° ' "	'	'	'	'	'	'	'	'	'	'	'	'	° ' "
88 53 15	0.0	+0.1	+0.3	+0.4	+0.5	+0.6	+0.8	+0.9	+1.0	+1.1	+1.3		88 53 15
88 53 20	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		88 53 20
88 53 25	0.0	+0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8		88 53 25
88 53 30	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5		88 53 30
88 53 35	0.0	0.0	+0.1	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.3		88 53 35
88 53 40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		88 53 40
88 53 45	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3		88 53 45
88 53 50	0.0	0.0	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5		88 53 50
88 53 55	0.0	-0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8		88 53 55
88 54 0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0		88 54 0
88 54 5	0.0	-0.1	-0.3	-0.4	-0.5	-0.6	-0.8	-0.9	-1.0	-1.1	-1.3		88 54 5

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Decl. Lat.							Variation for—	
	88° 53' 20''	88° 53' 30''	88° 53' 40''	88° 53' 50''	88° 54' 0''	88° 54' 10''	1' of Lat.	1'' of δ.
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	"	"
10 0	1 7 41.7	1 7 31.6	1 7 21.4	1 7 11.3	1 7 1.1	1 6 50.9	+0.20	-1.02
10 20	1 7 45.9	1 7 35.8	1 7 25.6	1 7 15.4	1 7 5.3	1 6 55.1	0.21	1.02
10 40	1 7 50.3	1 7 40.2	1 7 30.0	1 7 19.8	1 7 9.6	1 6 59.5	0.22	1.02
11 0	1 7 54.9	1 7 44.7	1 7 34.5	1 7 24.3	1 7 14.1	1 7 4.0	0.23	1.02
11 20	1 7 59.6	1 7 49.4	1 7 39.2	1 7 29.0	1 7 18.8	1 7 8.6	0.24	1.02
11 40	1 8 4.4	1 7 54.2	1 7 44.0	1 7 33.8	1 7 23.6	1 7 13.3	+0.24	-1.02
12 0	1 8 9.4	1 7 59.2	1 7 48.9	1 7 38.7	1 7 28.5	1 7 18.2	0.25	1.02
12 20	1 8 14.5	1 8 4.3	1 7 54.0	1 7 43.8	1 7 33.6	1 7 23.3	0.26	1.02
12 40	1 8 19.8	1 8 9.6	1 7 59.3	1 7 49.0	1 7 38.8	1 7 28.5	0.27	1.03
13 0	1 8 25.2	1 8 15.0	1 8 4.7	1 7 54.4	1 7 44.2	1 7 33.9	0.28	1.03
13 20	1 8 30.8	1 8 20.6	1 8 10.3	1 8 0.0	1 7 49.7	1 7 39.4	+0.28	-1.03
13 40	1 8 36.6	1 8 26.3	1 8 16.0	1 8 5.7	1 7 55.4	1 7 45.1	0.29	1.03
14 0	1 8 42.5	1 8 32.2	1 8 21.9	1 8 11.6	1 8 1.2	1 7 50.9	0.30	1.03
14 20	1 8 48.5	1 8 38.2	1 8 27.9	1 8 17.6	1 8 7.2	1 7 56.9	0.30	1.03
14 40	1 8 54.7	1 8 44.4	1 8 34.1	1 8 23.7	1 8 13.4	1 8 3.1	0.31	1.03
15 0	1 9 1.1	1 8 50.8	1 8 40.4	1 8 30.1	1 8 19.7	1 8 9.4	+0.32	-1.03
15 20	1 9 7.7	1 8 57.3	1 8 46.9	1 8 36.6	1 8 26.2	1 8 15.8	0.33	1.04
15 40	1 9 14.4	1 9 4.0	1 8 53.6	1 8 43.2	1 8 32.8	1 8 22.4	0.34	1.04
16 0	1 9 21.2	1 9 10.8	1 9 0.4	1 8 50.0	1 8 39.6	1 8 29.2	0.34	1.04
16 20	1 9 28.2	1 9 17.8	1 9 7.4	1 8 57.0	1 8 46.6	1 8 36.1	0.35	1.04
16 40	1 9 35.4	1 9 25.0	1 9 14.6	1 9 4.1	1 8 53.7	1 8 43.2	+0.36	-1.04
17 0	1 9 42.8	1 9 32.3	1 9 21.9	1 9 11.4	1 9 1.0	1 8 50.5	0.37	1.05
17 20	1 9 50.3	1 9 39.8	1 9 29.4	1 9 18.9	1 9 8.4	1 8 57.9	0.38	1.05
17 40	1 9 58.0	1 9 47.5	1 9 37.0	1 9 26.5	1 9 16.0	1 9 5.5	0.38	1.05
18 0	1 10 5.9	1 9 55.4	1 9 44.8	1 9 34.3	1 9 23.8	1 9 13.3	0.39	1.05
18 20	1 10 13.9	1 10 3.4	1 9 52.8	1 9 42.3	1 9 31.8	1 9 21.2	+0.40	-1.05
18 40	1 10 22.1	1 10 11.6	1 10 1.0	1 9 50.5	1 9 39.9	1 9 29.3	0.41	1.06
19 0	1 10 30.5	1 10 19.9	1 10 9.4	1 9 58.8	1 9 48.2	1 9 37.6	0.42	1.06
19 20	1 10 39.1	1 10 28.5	1 10 17.9	1 10 7.3	1 9 56.7	1 9 46.1	0.43	1.06
19 40	1 10 47.8	1 10 37.2	1 10 26.6	1 10 16.0	1 10 5.4	1 9 54.7	0.44	1.06
20 0	1 10 56.7	1 10 46.1	1 10 35.5	1 10 24.8	1 10 14.2	1 10 3.5	+0.45	-1.06
20 20	1 11 5.8	1 10 55.2	1 10 44.5	1 10 33.8	1 10 23.2	1 10 12.5	0.46	1.07
20 40	1 11 15.1	1 11 4.5	1 10 53.8	1 10 43.1	1 10 32.4	1 10 21.7	0.47	1.07
21 0	1 11 24.6	1 11 13.9	1 11 3.2	1 10 52.5	1 10 41.8	1 10 31.1	0.48	1.07
21 20	1 11 34.3	1 11 23.5	1 11 12.8	1 11 2.1	1 10 51.3	1 10 40.6	0.48	1.07
21 40	1 11 44.1	1 11 33.4	1 11 22.6	1 11 11.9	1 11 1.1	1 10 50.3	+0.49	-1.08
22 0	1 11 54.2	1 11 43.4	1 11 32.6	1 11 21.8	1 11 11.0	1 11 0.2	0.50	1.08
22 20	1 12 4.4	1 11 53.6	1 11 42.8	1 11 32.0	1 11 21.2	1 11 10.4	0.51	1.08
22 40	1 12 14.9	1 12 4.0	1 11 53.2	1 11 42.3	1 11 31.5	1 11 20.7	0.52	1.08
23 0	1 12 25.5	1 12 14.6	1 12 3.8	1 11 52.9	1 11 42.0	1 11 31.2	0.53	1.09
23 20	1 12 36.3	1 12 25.4	1 12 14.6	1 12 3.7	1 11 52.8	1 11 41.9	+0.54	-1.09
23 40	1 12 47.4	1 12 36.4	1 12 25.5	1 12 14.6	1 12 3.7	1 11 52.8	0.55	1.09
24 0	1 12 58.6	1 12 47.6	1 12 36.7	1 12 25.8	1 12 14.8	1 12 3.9	0.56	1.09
24 20	1 13 10.0	1 12 59.1	1 12 48.1	1 12 37.1	1 12 26.1	1 12 15.2	0.57	1.10
24 40	1 13 21.7	1 13 10.7	1 12 59.7	1 12 48.7	1 12 37.7	1 12 26.7	0.58	1.10
25 0	1 13 33.6	1 13 22.5	1 13 11.5	1 13 0.5	1 12 49.4	1 12 38.4	+0.59	-1.10
25 20	1 13 45.7	1 13 34.6	1 13 23.5	1 13 12.5	1 13 1.4	1 12 50.3	0.61	1.11
25 40	1 13 58.0	1 13 46.9	1 13 35.8	1 13 24.7	1 13 13.6	1 13 2.5	0.62	1.11
26 0	1 14 10.5	1 13 59.4	1 13 48.2	1 13 37.1	1 13 26.0	1 13 14.8	0.63	1.11
26 20	1 14 23.2	1 14 12.1	1 14 0.9	1 13 49.7	1 13 38.6	1 13 27.4	0.64	1.12
26 40	1 14 36.2	1 14 25.0	1 14 13.8	1 14 2.6	1 13 51.4	1 13 40.2	+0.65	-1.12
27 0	1 14 49.4	1 14 38.2	1 14 26.9	1 14 15.7	1 14 4.5	1 13 53.3	0.66	1.12
27 20	1 15 2.8	1 14 51.6	1 14 40.3	1 14 29.0	1 14 17.8	1 14 6.5	0.67	1.13
27 40	1 15 16.5	1 15 5.2	1 14 53.9	1 14 42.6	1 14 31.3	1 14 20.0	0.68	1.13
28 0	1 15 30.4	1 15 19.0	1 15 7.7	1 14 56.4	1 14 45.0	1 14 33.7	0.70	1.13
28 20	1 15 44.5	1 15 33.1	1 15 21.8	1 15 10.4	1 14 59.0	1 14 47.7	+0.71	-1.14
28 40	1 15 58.9	1 15 47.5	1 15 36.1	1 15 24.7	1 15 13.3	1 15 1.9	0.72	1.14
29 0	1 16 13.5	1 16 2.1	1 15 50.6	1 15 39.2	1 15 27.8	1 15 16.3	0.73	1.14
29 20	1 16 28.4	1 16 16.9	1 16 5.4	1 15 54.0	1 15 42.5	1 15 31.0	0.75	1.15
29 40	1 16 43.5	1 16 32.0	1 16 20.5	1 16 9.0	1 15 57.5	1 15 46.0	0.76	1.15
30 0	1 16 58.9	1 16 47.3	1 16 35.8	1 16 24.3	1 16 12.7	1 16 1.2	+0.77	-1.15

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Decl. Lat.							Variation for—	
	88° 53' 20"	88° 53' 30"	88° 53' 40"	88° 53' 50"	88° 54' 0"	88° 54' 10"	1' of Lat.	1" of δ.
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	"	"
30 0	1 16 58.9	1 16 47.3	1 16 35.8	1 16 24.3	1 16 12.7	1 16 1.2	+0.77	-1.15
30 10	1 17 6.7	1 16 55.1	1 16 43.6	1 16 32.0	1 16 20.4	1 16 8.9	0.78	1.16
30 20	1 17 14.6	1 17 3.0	1 16 51.4	1 16 39.8	1 16 28.2	1 16 16.6	0.78	1.16
30 30	1 17 22.5	1 17 10.9	1 16 59.3	1 16 47.7	1 16 36.0	1 16 24.4	0.79	1.16
30 40	1 17 30.5	1 17 18.8	1 17 7.2	1 16 55.6	1 16 43.9	1 16 32.3	0.80	1.16
30 50	1 17 38.5	1 17 26.9	1 17 15.2	1 17 3.6	1 16 51.9	1 16 40.3	+0.80	-1.16
31 0	1 17 46.6	1 17 35.0	1 17 23.3	1 17 11.6	1 17 0.0	1 16 48.3	0.81	1.17
31 10	1 17 54.8	1 17 43.1	1 17 31.5	1 17 19.8	1 17 8.1	1 16 56.4	0.82	1.17
31 20	1 18 3.1	1 17 51.4	1 17 39.7	1 17 28.0	1 17 16.3	1 17 4.6	0.82	1.17
31 30	1 18 11.4	1 17 59.7	1 17 48.0	1 17 36.2	1 17 24.5	1 17 12.8	0.83	1.17
31 40	1 18 19.8	1 18 8.1	1 17 56.3	1 17 44.6	1 17 32.8	1 17 21.1	+0.84	-1.17
31 50	1 18 28.3	1 18 16.5	1 18 4.7	1 17 53.0	1 17 41.2	1 17 29.4	0.85	1.18
32 0	1 18 36.8	1 18 25.0	1 18 13.2	1 18 1.5	1 17 49.7	1 17 37.9	0.85	1.18
32 10	1 18 45.4	1 18 33.6	1 18 21.8	1 18 10.0	1 17 58.2	1 17 46.4	0.86	1.18
32 20	1 18 54.1	1 18 42.3	1 18 30.5	1 18 18.6	1 18 6.8	1 17 54.9	0.87	1.18
32 30	1 19 2.9	1 18 51.0	1 18 39.2	1 18 27.3	1 18 15.5	1 18 3.6	+0.88	-1.19
32 40	1 19 11.7	1 18 59.8	1 18 48.0	1 18 36.1	1 18 24.2	1 18 12.3	0.88	1.19
32 50	1 19 20.6	1 19 8.7	1 18 56.8	1 18 44.9	1 18 33.0	1 18 21.1	0.89	1.19
33 0	1 19 29.6	1 19 17.7	1 19 5.7	1 18 53.8	1 18 41.9	1 18 30.0	0.89	1.19
33 10	1 19 38.6	1 19 26.7	1 19 14.7	1 19 2.8	1 18 50.8	1 18 38.9	0.90	1.19
33 20	1 19 47.8	1 19 35.8	1 19 23.8	1 19 11.8	1 18 59.9	1 18 47.9	+0.91	-1.20
33 30	1 19 57.0	1 19 45.0	1 19 33.0	1 19 21.0	1 19 9.0	1 18 57.0	0.92	1.20
33 40	1 20 6.2	1 19 54.2	1 19 42.2	1 19 30.2	1 19 18.2	1 19 6.2	0.92	1.20
33 50	1 20 15.6	1 20 3.5	1 19 51.5	1 19 39.5	1 19 27.4	1 19 15.4	0.93	1.20
34 0	1 20 25.0	1 20 12.9	1 20 0.9	1 19 48.8	1 19 36.8	1 19 24.7	0.94	1.21
34 10	1 20 34.5	1 20 22.4	1 20 10.3	1 19 58.3	1 19 46.2	1 19 34.1	+0.95	-1.21
34 20	1 20 44.1	1 20 32.0	1 20 19.9	1 20 7.8	1 19 55.7	1 19 43.6	0.96	1.21
34 30	1 20 53.8	1 20 41.6	1 20 29.5	1 20 17.4	1 20 5.2	1 19 53.1	0.96	1.21
34 40	1 21 3.5	1 20 51.4	1 20 39.2	1 20 27.0	1 20 14.9	1 20 2.7	0.97	1.22
34 50	1 21 13.3	1 21 1.2	1 20 49.0	1 20 36.8	1 20 24.6	1 20 12.4	0.98	1.22
35 0	1 21 23.2	1 21 11.0	1 20 58.8	1 20 46.6	1 20 34.4	1 20 22.2	+0.99	-1.22
35 10	1 21 33.2	1 21 21.0	1 21 8.8	1 20 56.5	1 20 44.3	1 20 32.1	1.00	1.22
35 20	1 21 43.3	1 21 31.1	1 21 18.8	1 21 6.5	1 20 54.3	1 20 42.0	1.01	1.23
35 30	1 21 53.5	1 21 41.2	1 21 28.9	1 21 16.6	1 21 4.3	1 20 52.0	1.02	1.23
35 40	1 22 3.7	1 21 51.4	1 21 39.1	1 21 26.8	1 21 14.5	1 21 2.2	1.02	1.23
35 50	1 22 14.0	1 22 1.7	1 21 49.4	1 21 37.0	1 21 24.7	1 21 12.4	+1.03	-1.23
36 0	1 22 24.4	1 22 12.1	1 21 59.7	1 21 47.3	1 21 35.0	1 21 22.6	1.04	1.24
36 10	1 22 34.9	1 22 22.5	1 22 10.2	1 21 57.8	1 21 45.4	1 21 33.0	1.05	1.24
36 20	1 22 45.5	1 22 33.1	1 22 20.7	1 22 8.3	1 21 55.8	1 21 43.4	1.06	1.24
36 30	1 22 56.2	1 22 43.7	1 22 31.3	1 22 18.9	1 22 6.4	1 21 54.0	1.06	1.24
36 40	1 23 6.9	1 22 54.5	1 22 42.0	1 22 29.5	1 22 17.1	1 22 4.6	+1.07	-1.25
36 50	1 23 17.8	1 23 5.3	1 22 52.8	1 22 40.3	1 22 27.8	1 22 15.3	1.08	1.25
37 0	1 23 28.7	1 23 16.2	1 23 3.7	1 22 51.2	1 22 38.6	1 22 26.1	1.09	1.25
37 10	1 23 39.7	1 23 27.2	1 23 14.6	1 23 2.1	1 22 49.5	1 22 37.0	1.10	1.25
37 20	1 23 50.9	1 23 38.3	1 23 25.7	1 23 13.1	1 23 0.5	1 22 48.0	1.11	1.26
37 30	1 24 2.1	1 23 49.5	1 23 36.9	1 23 24.3	1 23 11.6	1 22 59.0	+1.12	-1.26
37 40	1 24 13.4	1 24 0.7	1 23 48.1	1 23 35.5	1 23 22.8	1 23 10.2	1.13	1.26
37 50	1 24 24.8	1 24 12.1	1 23 59.4	1 23 46.8	1 23 34.1	1 23 21.5	1.14	1.27
38 0	1 24 36.3	1 24 23.6	1 24 10.9	1 23 58.2	1 23 45.5	1 23 32.8	1.15	1.27
38 10	1 24 47.9	1 24 35.1	1 24 22.4	1 24 9.7	1 23 57.0	1 23 44.2	1.16	1.27
38 20	1 24 59.5	1 24 46.8	1 24 34.0	1 24 21.3	1 24 8.6	1 23 55.8	+1.17	-1.27
38 30	1 25 11.3	1 24 58.5	1 24 45.8	1 24 33.0	1 24 20.2	1 24 7.4	1.18	1.28
38 40	1 25 23.2	1 25 10.4	1 24 57.6	1 24 44.8	1 24 32.0	1 24 19.2	1.19	1.28
38 50	1 25 35.2	1 25 22.3	1 25 9.5	1 24 56.7	1 24 43.8	1 24 31.0	1.20	1.28
39 0	1 25 47.2	1 25 34.4	1 25 21.5	1 25 8.6	1 24 55.8	1 24 42.9	1.21	1.29
39 10	1 25 59.4	1 25 46.5	1 25 33.6	1 25 20.7	1 25 7.8	1 24 54.9	+1.22	-1.29
39 20	1 26 11.7	1 25 58.8	1 25 45.8	1 25 32.9	1 25 20.0	1 25 7.0	1.23	1.29
39 30	1 26 24.1	1 26 11.1	1 25 58.2	1 25 45.2	1 25 32.3	1 25 19.3	1.24	1.30
39 40	1 26 36.6	1 26 23.6	1 26 10.6	1 25 57.6	1 25 44.6	1 25 31.6	1.25	1.30
39 50	1 26 49.2	1 26 36.1	1 26 23.1	1 26 10.1	1 25 57.1	1 25 44.1	1.26	1.30
40 0	1 27 1.9	1 26 48.8	1 26 35.8	1 26 22.7	1 26 9.6	1 25 56.6	+1.27	-1.31

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Decl. Lat.							Variation for—	
	88° 53' 20"	88° 53' 30"	88° 53' 40"	88° 53' 50"	88° 54' 0"	88° 54' 10"	1' of Lat.	1" of δ.
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	"	"
40 0	1 27 1.9	1 26 48.8	1 26 35.8	1 26 22.7	1 26 9.6	1 25 56.6	+1.27	-1.31
40 10	1 27 14.7	1 27 1.6	1 26 48.5	1 26 35.4	1 26 22.3	1 26 9.2	1.28	1.31
40 20	1 27 27.6	1 27 14.5	1 27 1.3	1 26 48.2	1 26 35.1	1 26 22.0	1.29	1.31
40 30	1 27 40.6	1 27 27.4	1 27 14.3	1 27 1.1	1 26 48.0	1 26 34.8	1.30	1.32
40 40	1 27 53.7	1 27 40.5	1 27 27.4	1 27 14.2	1 27 1.0	1 26 47.8	1.31	1.32
40 50	1 28 7.0	1 27 53.7	1 27 40.5	1 27 27.3	1 27 14.1	1 27 0.9	+1.32	-1.32
41 0	1 28 20.3	1 28 7.0	1 27 53.8	1 27 40.5	1 27 27.3	1 27 14.0	1.33	1.33
41 10	1 28 33.8	1 28 20.5	1 28 7.2	1 27 53.9	1 27 40.6	1 27 27.3	1.34	1.33
41 20	1 28 47.3	1 28 34.0	1 28 20.7	1 28 7.4	1 27 54.1	1 27 40.8	1.35	1.33
41 30	1 29 1.0	1 28 47.7	1 28 34.3	1 28 21.0	1 28 7.6	1 27 54.3	1.37	1.33
41 40	1 29 14.8	1 29 1.5	1 28 48.1	1 28 34.7	1 28 21.3	1 28 7.9	+1.38	-1.34
41 50	1 29 28.8	1 29 15.3	1 29 1.9	1 28 48.5	1 28 35.1	1 28 21.6	1.39	1.34
42 0	1 29 42.8	1 29 29.3	1 29 15.9	1 29 2.4	1 28 49.0	1 28 35.5	1.40	1.35
42 10	1 29 57.0	1 29 43.5	1 29 30.0	1 29 16.5	1 29 3.0	1 28 49.5	1.41	1.35
42 20	1 30 11.3	1 29 57.7	1 29 44.2	1 29 30.7	1 29 17.1	1 29 3.6	1.42	1.35
42 30	1 30 25.7	1 30 12.1	1 29 58.5	1 29 45.0	1 29 31.4	1 29 17.8	+1.44	-1.36
42 40	1 30 40.2	1 30 26.6	1 30 13.0	1 29 59.4	1 29 45.8	1 29 32.2	1.45	1.36
42 50	1 30 54.8	1 30 41.2	1 30 27.6	1 30 13.9	1 30 0.3	1 29 46.6	1.46	1.36
43 0	1 31 9.6	1 30 55.9	1 30 42.3	1 30 28.6	1 30 14.9	1 30 1.2	1.47	1.37
43 10	1 31 24.5	1 31 10.8	1 30 57.1	1 30 43.4	1 30 29.7	1 30 15.9	1.48	1.37
43 20	1 31 39.6	1 31 25.8	1 31 12.0	1 30 58.3	1 30 44.6	1 30 30.8	+1.50	-1.38
43 30	1 31 54.7	1 31 40.9	1 31 27.1	1 31 13.3	1 30 59.6	1 30 45.8	1.51	1.38
43 40	1 32 10.0	1 31 56.2	1 31 42.3	1 31 28.5	1 31 14.7	1 31 0.9	1.53	1.38
43 50	1 32 25.4	1 32 11.6	1 31 57.7	1 31 43.8	1 31 30.0	1 31 16.1	1.54	1.39
44 0	1 32 41.0	1 32 27.1	1 32 13.2	1 31 59.3	1 31 45.4	1 31 31.5	1.55	1.39
44 10	1 32 56.7	1 32 42.7	1 32 28.8	1 32 14.8	1 32 0.9	1 31 47.0	+1.56	-1.39
44 20	1 33 12.5	1 32 58.5	1 32 44.5	1 32 30.5	1 32 16.6	1 32 2.6	1.58	1.40
44 30	1 33 28.5	1 33 14.4	1 33 0.4	1 32 46.4	1 32 32.4	1 32 18.4	1.59	1.40
44 40	1 33 44.6	1 33 30.5	1 33 16.4	1 33 2.4	1 32 48.3	1 32 34.3	1.61	1.41
44 50	1 34 0.8	1 33 46.7	1 33 32.6	1 33 18.5	1 33 4.4	1 32 50.3	1.62	1.41
45 0	1 34 17.2	1 34 3.1	1 33 48.9	1 33 34.8	1 33 20.6	1 33 6.5	+1.64	-1.41
45 10	1 34 33.7	1 34 19.6	1 34 5.4	1 33 51.2	1 33 37.0	1 33 22.8	1.65	1.42
45 20	1 34 50.4	1 34 36.2	1 34 22.0	1 34 7.7	1 33 53.5	1 33 39.3	1.66	1.42
45 30	1 35 7.2	1 34 53.0	1 34 38.7	1 34 24.4	1 34 10.2	1 33 55.9	1.68	1.43
45 40	1 35 24.2	1 35 9.9	1 34 55.6	1 34 41.3	1 34 27.0	1 34 12.7	1.69	1.43
45 50	1 35 41.3	1 35 27.0	1 35 12.6	1 34 58.3	1 34 43.9	1 34 29.6	+1.71	-1.43
46 0	1 35 58.6	1 35 44.2	1 35 29.8	1 35 15.4	1 35 1.0	1 34 46.6	1.72	1.44
46 10	1 36 16.0	1 36 1.6	1 35 47.2	1 35 32.7	1 35 18.3	1 35 3.8	1.74	1.44
46 20	1 36 33.6	1 36 19.1	1 36 4.7	1 35 50.2	1 35 35.7	1 35 21.2	1.75	1.45
46 30	1 36 51.4	1 36 36.8	1 36 22.3	1 36 7.8	1 35 53.3	1 35 38.7	1.77	1.45
46 40	1 37 9.3	1 36 54.7	1 36 40.1	1 36 25.5	1 36 11.0	1 35 56.4	+1.78	-1.46
46 50	1 37 27.3	1 37 12.7	1 36 58.1	1 36 43.4	1 36 28.8	1 36 14.2	1.80	1.46
47 0	1 37 45.5	1 37 30.9	1 37 16.2	1 37 1.5	1 36 46.9	1 36 32.2	1.82	1.47
47 10	1 38 3.9	1 37 49.2	1 37 34.5	1 37 19.8	1 37 5.1	1 36 50.4	1.84	1.47
47 20	1 38 22.5	1 38 7.7	1 37 53.0	1 37 38.2	1 37 23.5	1 37 8.7	1.85	1.48
47 30	1 38 41.2	1 38 26.4	1 38 11.6	1 37 56.8	1 37 42.0	1 37 27.2	+1.87	-1.48
47 40	1 39 0.1	1 38 45.2	1 38 30.4	1 38 15.5	1 38 0.7	1 37 45.8	1.88	1.49
47 50	1 39 19.1	1 39 4.2	1 38 49.3	1 38 34.4	1 38 19.5	1 38 4.6	1.90	1.49
48 0	1 39 38.4	1 39 23.4	1 39 8.5	1 38 53.5	1 38 38.6	1 38 23.6	1.92	1.50
48 10	1 39 57.8	1 39 42.8	1 39 27.8	1 39 12.8	1 38 57.9	1 38 42.8	1.94	1.50
48 20	1 40 17.4	1 40 2.3	1 39 47.3	1 39 32.2	1 39 17.2	1 39 2.1	+1.95	-1.51
48 30	1 40 37.1	1 40 22.0	1 40 6.9	1 39 51.8	1 39 36.7	1 39 21.6	1.97	1.51
48 40	1 40 57.1	1 40 41.9	1 40 26.8	1 40 11.6	1 39 56.5	1 39 41.3	1.99	1.52
48 50	1 41 17.2	1 41 2.0	1 40 46.8	1 40 31.6	1 40 16.4	1 40 1.2	2.01	1.52
49 0	1 41 37.5	1 41 22.3	1 41 7.0	1 40 51.8	1 40 36.5	1 40 21.3	2.03	1.52
49 10	1 41 58.0	1 41 42.7	1 41 27.4	1 41 12.1	1 40 56.8	1 40 41.5	+2.05	-1.53
49 20	1 42 18.7	1 42 3.4	1 41 48.0	1 41 32.7	1 41 17.3	1 41 2.0	2.07	1.53
49 30	1 42 39.6	1 42 24.2	1 42 8.8	1 41 53.4	1 41 38.0	1 41 22.6	2.09	1.54
49 40	1 43 0.7	1 42 45.2	1 42 29.8	1 42 14.3	1 41 58.9	1 41 43.4	2.11	1.55
49 50	1 43 22.0	1 43 6.5	1 42 51.0	1 42 35.4	1 42 19.9	1 42 4.4	2.13	1.55
50 0	1 43 43.4	1 43 27.9	1 43 12.3	1 42 56.8	1 42 41.2	1 42 25.6	+2.15	-1.56

TABLE V.

705

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Decl. Lat.	88° 53' 20"	88° 53' 30"	88° 53' 40"	88° 53' 50"	88° 54' 0"	88° 54' 10"	Variation for—	
							1' of Lat.	1" of δ.
° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	"	"
50 0	1 43 43.4	1 43 27.9	1 43 12.3	1 42 56.8	1 42 41.2	1 42 25.6	+2.15	-1.56
50 10	1 44 5.1	1 43 49.5	1 43 33.9	1 43 18.3	1 43 2.7	1 42 47.1	2.17	1.56
50 20	1 44 27.0	1 44 11.3	1 43 55.7	1 43 40.0	1 43 24.3	1 43 8.7	2.19	1.57
50 30	1 44 49.1	1 44 33.4	1 44 17.7	1 44 1.9	1 43 46.2	1 43 30.5	2.21	1.57
50 40	1 45 11.4	1 44 55.6	1 44 39.9	1 44 24.1	1 44 8.3	1 43 52.5	2.23	1.58
50 50	1 45 33.9	1 45 18.1	1 45 2.3	1 44 46.4	1 44 30.6	1 44 14.7	+2.25	-1.58
51 0	1 45 56.7	1 45 40.8	1 45 24.9	1 45 9.0	1 44 53.1	1 44 37.2	2.27	1.59
51 10	1 46 19.6	1 46 3.7	1 45 47.7	1 45 31.8	1 45 15.8	1 44 59.9	2.29	1.59
51 20	1 46 42.8	1 46 26.8	1 46 10.8	1 45 54.8	1 45 38.7	1 45 22.7	2.31	1.60
51 30	1 47 6.2	1 46 50.1	1 46 34.1	1 46 18.0	1 46 1.9	1 45 45.8	2.33	1.61
51 40	1 47 29.8	1 47 13.7	1 47 57.6	1 46 41.4	1 46 25.3	1 46 9.2	+2.36	-1.61
51 50	1 47 53.7	1 47 37.5	1 47 21.3	1 47 5.1	1 46 48.9	1 46 32.7	2.38	1.62
52 0	1 48 17.8	1 48 1.5	1 47 45.2	1 47 29.0	1 47 12.7	1 46 56.5	2.40	1.63
52 10	1 48 42.1	1 48 25.8	1 48 9.4	1 47 53.1	1 47 36.8	1 47 20.5	2.43	1.63
52 20	1 49 6.6	1 48 50.3	1 48 33.9	1 48 17.5	1 48 1.1	1 47 44.8	2.46	1.64
52 30	1 49 31.4	1 49 15.0	1 48 58.6	1 48 42.1	1 48 25.7	1 48 9.3	+2.48	-1.64
52 40	1 49 56.5	1 49 40.0	1 49 23.5	1 49 7.0	1 48 50.5	1 48 34.0	2.50	1.65
52 50	1 50 21.8	1 50 5.2	1 49 48.6	1 49 32.1	1 49 15.5	1 48 59.0	2.52	1.66
53 0	1 50 47.3	1 50 30.7	1 50 14.0	1 49 57.4	1 49 40.8	1 49 24.2	2.55	1.66
53 10	1 51 13.1	1 50 56.4	1 50 39.7	1 50 23.0	1 50 6.3	1 49 49.7	2.57	1.67
53 20	1 51 39.2	1 51 22.4	1 51 5.6	1 50 48.9	1 50 32.1	1 50 15.4	+2.60	-1.68
53 30	1 52 5.5	1 51 48.7	1 51 31.8	1 51 15.0	1 50 58.2	1 50 41.4	2.63	1.68
53 40	1 52 32.0	1 52 15.2	1 51 58.3	1 51 41.4	1 51 24.5	1 51 7.6	2.66	1.69
53 50	1 52 58.9	1 52 41.9	1 52 25.0	1 52 8.0	1 51 51.1	1 51 34.1	2.68	1.70
54 0	1 53 26.0	1 53 9.0	1 52 52.0	1 52 35.0	1 52 18.0	1 52 0.9	2.71	1.70
54 10	1 53 53.4	1 53 36.3	1 53 19.3	1 53 2.2	1 52 45.1	1 52 28.0	+2.74	-1.71
54 20	1 54 21.1	1 54 3.9	1 53 46.8	1 53 29.6	1 53 12.5	1 52 55.3	2.76	1.72
54 30	1 54 49.1	1 54 31.8	1 54 14.6	1 53 57.4	1 53 40.1	1 53 22.9	2.79	1.72
54 40	1 55 17.3	1 55 0.0	1 54 42.7	1 54 25.4	1 54 8.1	1 53 50.8	2.82	1.73
54 50	1 55 45.8	1 55 28.5	1 55 11.1	1 54 53.7	1 54 36.4	1 54 19.0	2.85	1.74
55 0	1 56 14.7	1 55 57.2	1 55 39.8	1 55 22.4	1 55 4.9	1 54 47.5	+2.88	-1.74
55 10	1 56 43.8	1 56 26.3	1 56 8.8	1 55 51.3	1 55 33.8	1 55 16.3	2.91	1.75
55 20	1 57 13.3	1 56 55.7	1 56 38.1	1 56 20.5	1 56 2.9	1 55 45.3	2.94	1.76
55 30	1 57 43.0	1 57 25.4	1 57 7.7	1 56 50.0	1 56 32.3	1 56 14.7	2.97	1.77
55 40	1 58 13.1	1 57 55.3	1 57 37.6	1 57 19.8	1 57 2.1	1 56 44.4	3.00	1.77
55 50	1 58 43.5	1 58 25.6	1 58 7.8	1 57 50.0	1 57 32.2	1 57 14.4	+3.04	-1.78
56 0	1 59 14.2	1 58 56.3	1 58 38.4	1 58 20.5	1 58 2.6	1 57 44.7	3.07	1.79
56 10	1 59 45.2	1 59 27.2	1 59 9.2	1 58 51.3	1 58 33.3	1 58 15.3	3.10	1.80
56 20	2 0 16.5	1 59 58.5	1 59 40.4	1 59 22.4	1 59 4.4	1 58 46.3	3.14	1.80
56 30	2 0 48.2	2 0 30.1	2 0 12.0	1 59 53.9	1 59 35.8	1 59 17.6	3.17	1.81
56 40	2 1 20.3	2 1 2.1	2 0 43.9	2 0 25.7	2 0 7.5	1 59 49.2	+3.20	-1.82
56 50	2 1 52.7	2 1 34.4	2 1 16.1	2 0 57.8	2 0 39.5	2 0 21.2	3.24	1.83
57 0	2 2 25.4	2 2 7.0	2 1 48.7	2 1 30.3	2 1 11.9	2 0 53.6	3.27	1.84
57 10	2 2 58.5	2 2 40.0	2 2 21.6	2 2 3.2	2 1 44.7	2 1 26.3	3.31	1.84
57 20	2 3 32.0	2 3 13.4	2 2 54.9	2 2 36.4	2 2 17.8	2 1 59.3	3.34	1.85
57 30	2 4 5.8	2 3 47.2	2 3 28.6	2 3 9.9	2 2 51.3	2 2 32.7	+3.38	-1.86
57 40	2 4 40.0	2 4 21.3	2 4 2.6	2 3 43.9	2 3 25.2	2 3 6.5	3.42	1.87
57 50	2 5 14.6	2 4 55.8	2 4 37.0	2 4 18.2	2 3 59.4	2 3 40.6	3.46	1.88
58 0	2 5 49.5	2 5 30.6	2 5 11.8	2 4 52.9	2 4 34.0	2 4 15.1	3.49	1.89
58 10	2 6 24.9	2 6 5.9	2 5 46.9	2 5 28.0	2 5 9.0	2 4 50.0	3.53	1.90
58 20	2 7 0.6	2 6 41.6	2 6 22.5	2 6 3.5	2 5 44.4	2 5 25.4	+3.57	-1.90
58 30	2 7 36.8	2 7 17.6	2 6 58.5	2 6 39.4	2 6 20.2	2 6 1.1	3.62	1.91
58 40	2 8 13.4	2 7 54.1	2 7 34.9	2 7 15.7	2 6 56.4	2 6 37.2	3.66	1.92
58 50	2 8 50.4	2 8 31.0	2 8 11.7	2 7 52.4	2 7 33.0	2 7 13.7	3.70	1.93
59 0	2 9 27.8	2 9 8.3	2 8 48.9	2 8 29.5	2 8 10.1	2 7 50.6	3.74	1.94
59 10	2 10 5.6	2 9 46.1	2 9 26.6	2 9 7.0	2 8 47.5	2 8 28.0	+3.78	-1.95
59 20	2 10 43.9	2 10 24.3	2 10 4.7	2 9 45.0	2 9 25.4	2 9 5.8	3.83	1.96
59 30	2 11 22.6	2 11 2.9	2 10 43.2	2 10 23.5	2 10 3.7	2 9 44.0	3.87	1.97
59 40	2 12 1.8	2 11 42.0	2 11 22.2	2 11 2.4	2 10 42.5	2 10 22.7	3.92	1.98
59 50	2 12 41.4	2 12 21.5	2 12 1.6	2 11 41.7	2 11 21.8	2 11 1.8	3.96	1.99
60 0	2 13 21.5	2 13 1.5	2 12 41.5	2 12 21.5	2 12 1.5	2 11 41.4	+4.01	-2.00

AZIMUTH OF POLARIS AT ELONGATION, 1923.

Decl. Lat.							Variation for—	
	88° 53' 20"	88° 53' 30"	88° 53' 40"	88° 53' 50"	88° 54' 0"	88° 54' 10"	1' of Lat.	1" of δ.
60 0	2 13 21.5	2 13 1.5	2 12 41.5	2 12 21.5	2 12 1.5	2 11 41.4	+4.01	-2.00
60 10	2 14 2.1	2 13 42.0	2 13 21.8	2 13 1.7	2 12 41.6	2 12 21.5	4.05	2.01
60 20	2 14 43.1	2 14 22.9	2 14 2.7	2 13 42.5	2 13 22.3	2 13 2.1	4.10	2.02
60 30	2 15 24.7	2 15 4.4	2 14 44.0	2 14 23.7	2 14 3.4	2 13 43.1	4.15	2.03
60 40	2 16 6.7	2 15 46.3	2 15 25.9	2 15 5.4	2 14 45.0	2 14 24.6	4.20	2.04
60 50	2 16 49.3	2 16 28.7	2 16 8.2	2 15 47.7	2 15 27.2	2 15 6.6	+4.26	-2.05
61 0	2 17 32.4	2 17 11.7	2 16 51.1	2 16 30.4	2 16 9.8	2 15 49.1	4.31	2.07
61 10	2 18 16.0	2 17 55.2	2 17 34.5	2 17 13.7	2 16 52.9	2 16 32.2	4.36	2.08
61 20	2 19 0.1	2 18 39.2	2 18 18.4	2 17 57.5	2 17 36.6	2 17 15.8	4.41	2.09
61 30	2 19 44.7	2 19 23.8	2 19 2.8	2 18 41.8	2 18 20.8	2 17 59.9	4.46	2.10
61 40	2 20 30.0	2 20 8.9	2 19 47.8	2 19 26.7	2 19 5.6	2 18 44.6	+4.52	-2.11
61 50	2 21 15.8	2 20 54.6	2 20 33.4	2 20 12.2	2 19 51.0	2 19 29.8	4.58	2.12
62 0	2 22 2.1	2 21 40.8	2 21 19.5	2 20 58.2	2 20 36.8	2 20 15.5	4.63	2.13
62 10	2 22 49.1	2 22 27.6	2 22 6.2	2 21 44.8	2 21 23.3	2 21 1.9	4.69	2.14
62 20	2 23 36.6	2 23 15.0	2 22 53.5	2 22 31.9	2 22 10.4	2 21 48.8	4.75	2.16
62 30	2 24 24.7	2 24 3.0	2 23 41.4	2 23 19.7	2 22 58.0	2 22 36.4	+4.82	-2.17
62 40	2 25 13.5	2 24 51.7	2 24 29.9	2 24 8.1	2 23 46.3	2 23 24.5	4.88	2.18
62 50	2 26 2.9	2 25 40.9	2 25 19.0	2 24 57.1	2 24 35.2	2 24 13.3	4.94	2.19
63 0	2 26 52.9	2 26 30.8	2 26 8.8	2 25 46.8	2 25 24.7	2 25 2.7	5.00	2.20
63 10	2 27 43.6	2 27 21.4	2 26 59.2	2 26 37.1	2 26 14.9	2 25 52.7	5.07	2.22
63 20	2 28 34.9	2 28 12.6	2 27 50.3	2 27 28.0	2 27 5.7	2 26 43.4	+5.13	-2.23
63 30	2 29 26.9	2 29 4.5	2 28 42.0	2 28 19.6	2 27 57.2	2 27 34.8	5.20	2.24
63 40	2 30 19.6	2 29 57.0	2 29 34.5	2 29 11.9	2 28 49.4	2 28 26.8	5.27	2.26
63 50	2 31 13.0	2 30 50.3	2 30 27.6	2 30 4.9	2 29 42.2	2 29 19.5	5.34	2.27
64 0	2 32 7.1	2 31 44.3	2 31 21.4	2 30 58.6	2 30 35.8	2 30 13.0	5.41	2.28
64 10	2 33 1.9	2 32 39.0	2 32 16.0	2 31 53.0	2 31 30.1	2 31 7.1	+5.49	-2.30
64 20	2 33 57.5	2 33 34.4	2 33 11.3	2 32 48.2	2 32 25.1	2 32 2.0	5.56	2.31
64 30	2 34 53.8	2 34 30.6	2 34 7.3	2 33 44.1	2 33 20.9	2 32 57.6	5.64	2.32
64 40	2 35 50.9	2 35 27.6	2 35 4.2	2 34 40.8	2 34 17.4	2 33 54.0	5.71	2.34
64 50	2 36 48.8	2 36 25.3	2 36 1.8	2 35 38.2	2 35 14.7	2 34 51.2	5.79	2.35
65 0	2 37 47.5	2 37 23.8	2 37 0.2	2 36 36.5	2 36 12.8	2 35 49.1	+5.87	-2.37
65 10	2 38 47.1	2 38 23.2	2 37 59.4	2 37 35.6	2 37 11.7	2 36 47.9	5.96	2.38
65 20	2 39 47.4	2 39 23.4	2 38 59.4	2 38 35.5	2 38 11.5	2 37 47.5	6.04	2.40
65 30	2 40 48.6	2 40 24.5	2 40 0.3	2 39 36.2	2 39 12.1	2 38 47.9	6.13	2.41
65 40	2 41 50.7	2 41 26.4	2 41 2.1	2 40 37.8	2 40 13.5	2 39 49.2	6.21	2.43
65 50	2 42 53.6	2 42 29.2	2 42 4.7	2 41 40.3	2 41 15.8	2 40 51.4	+6.30	-2.45
66 0	2 43 57.5	2 43 32.9	2 43 8.3	2 42 43.7	2 42 19.0	2 41 54.4	6.39	2.46
66 10	2 45 2.3	2 44 37.5	2 44 12.7	2 43 48.0	2 43 23.2	2 42 58.4	6.48	2.48
66 20	2 46 8.0	2 45 43.1	2 45 18.1	2 44 53.2	2 44 28.3	2 44 3.3	6.58	2.49
66 30	2 47 14.7	2 46 49.6	2 46 24.5	2 45 59.4	2 45 34.3	2 45 9.2	6.68	2.51
66 40	2 48 22.4	2 47 57.1	2 47 31.8	2 47 6.6	2 46 41.3	2 46 16.0	+6.78	-2.53
66 50	2 49 31.1	2 49 5.6	2 48 40.2	2 48 14.7	2 47 49.3	2 47 23.8	6.88	2.55
67 0	2 50 40.8	2 50 15.2	2 49 49.6	2 49 23.9	2 48 58.3	2 48 32.7	6.98	2.56
67 10	2 51 51.6	2 51 25.8	2 51 0.0	2 50 34.2	2 50 8.4	2 49 42.6	7.08	2.58
67 20	2 53 3.4	2 52 37.4	2 52 11.4	2 51 45.5	2 51 19.5	2 50 53.5	7.19	2.60
67 30	2 54 16.3	2 53 50.2	2 53 24.0	2 52 57.9	2 52 31.7	2 52 5.5	+7.30	-2.62
67 40	2 55 30.4	2 55 4.1	2 54 37.7	2 54 11.4	2 53 45.0	2 53 18.7	7.42	2.63
67 50	2 56 45.6	2 56 19.1	2 55 52.5	2 55 26.0	2 54 59.5	2 54 32.9	7.53	2.65
68 0	2 58 2.0	2 57 35.3	2 57 8.5	2 56 41.8	2 56 15.1	2 55 48.3	7.65	2.67
68 10	2 59 19.6	2 58 52.6	2 58 25.7	2 57 58.8	2 57 31.9	2 57 4.9	7.77	2.69
68 20	3 0 38.4	3 0 11.2	2 59 44.1	2 59 17.0	2 58 49.9	2 58 22.8	+7.90	-2.71
68 30	3 1 58.4	3 1 31.1	3 1 3.8	3 0 36.5	3 0 9.2	2 59 41.9	8.02	2.73
68 40	3 3 19.8	3 2 52.3	3 2 24.7	3 1 57.2	3 1 29.7	3 1 2.2	8.15	2.75
68 50	3 4 42.5	3 4 14.7	3 3 47.0	3 3 19.3	3 2 51.5	3 2 23.8	8.28	2.77
69 0	3 6 6.5	3 5 38.5	3 5 10.6	3 4 42.7	3 4 14.7	3 3 46.8	8.42	2.79
69 10	3 7 31.9	3 7 3.7	3 6 35.5	3 6 7.4	3 5 39.2	3 5 11.1	+8.56	-2.82
69 20	3 8 58.7	3 8 30.3	3 8 1.9	3 7 33.5	3 7 5.2	3 6 36.8	8.70	2.84
69 30	3 10 26.9	3 9 58.3	3 9 29.7	3 9 1.1	3 8 32.6	3 8 4.0	8.84	2.86
69 40	3 11 56.7	3 11 27.8	3 10 59.0	3 10 30.2	3 10 1.4	3 9 32.6	8.99	2.88
69 50	3 13 27.9	3 12 58.9	3 12 29.8	3 12 0.8	3 11 31.7	3 11 2.7	9.15	2.90
70 0	3 15 0.8	3 14 31.5	3 14 2.2	3 13 32.9	3 13 3.6	3 12 34.4	+9.31	-2.93

FOR REDUCING TO ELONGATION OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong.									Azimuth at Elong.
	1° 0'	1° 10'	1° 20'	1° 30'	1° 40'	1° 50'	2° 0'	2° 10'	
* Time.									Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	0.0	0.0	0.0	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	+ 0.1	+ 0.2	+ 0.2	0.2	0.2	0.3	0.3	0.3	2
3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	3
4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	4
5	+ 0.9	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	5
6	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.7	6
7	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	7
8	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	8
9	2.8	3.2	3.7	4.2	4.6	5.1	5.6	6.0	9
10	+ 3.4	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.9	+ 7.4	10
11	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	11
12	4.9	5.8	6.6	7.4	8.2	9.0	9.9	10.7	12
13	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13
14	6.7	7.8	9.0	10.1	11.2	12.3	13.4	14.6	14
15	+ 7.7	+ 9.0	+10.3	+11.6	+12.8	+14.1	+15.4	+16.7	15
16	8.8	10.2	11.7	13.2	14.6	16.1	17.5	19.0	16
17	9.9	11.5	13.2	14.9	16.5	18.2	19.8	21.5	17
18	11.1	12.9	14.8	16.7	18.5	20.4	22.2	24.1	18
19	12.4	14.4	16.5	18.6	20.6	22.7	24.7	26.8	19
20	+13.7	+16.0	+18.3	+20.6	+22.8	+25.1	+27.4	+29.7	20
21	15.1	17.6	20.1	22.7	25.2	27.7	30.2	32.7	21
22	16.6	19.3	22.1	24.9	27.6	30.4	33.2	35.9	22
23	18.1	21.1	24.2	27.2	30.2	33.2	36.2	39.3	23
24	19.7	23.0	26.3	29.6	32.9	36.2	39.5	42.8	24
25	+21.4	+25.0	+28.5	+32.1	+35.7	+39.2	+42.8	+46.4	25

Azimuth at Elong.									Azimuth at Elong.
	2° 10'	2° 20'	2° 30'	2° 40'	2° 50'	3° 0'	3° 10'	3° 20'	
* Time.									Time.*
m	"	"	"	"	"	"	"	"	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	1
2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	2
3	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0	3
4	1.2	1.3	1.4	1.5	1.6	1.6	1.7	1.8	4
5	+ 1.9	+ 2.0	+ 2.1	+ 2.3	+ 2.4	+ 2.6	+ 2.7	+ 2.9	5
6	2.7	2.9	3.1	3.3	3.5	3.7	3.9	4.1	6
7	3.7	3.9	4.2	4.5	4.8	5.0	5.3	5.6	7
8	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	8
9	6.0	6.5	7.0	7.4	7.9	8.3	8.8	9.3	9
10	+ 7.4	+ 8.0	+ 8.6	+ 9.2	+ 9.7	+10.3	+10.9	+11.4	10
11	9.0	9.7	10.4	11.1	11.8	12.4	13.1	13.8	11
12	10.7	11.5	12.3	13.2	14.0	14.8	15.6	16.5	12
13	12.6	13.5	14.5	15.4	16.4	17.4	18.4	19.3	13
14	14.6	15.7	16.8	17.9	19.0	20.2	21.3	22.4	14
15	+16.7	+18.0	+19.3	+20.6	+21.9	+23.1	+24.4	+25.7	15
16	19.0	20.5	21.9	23.4	24.9	26.3	27.8	29.3	16
17	21.5	23.1	24.8	26.4	28.1	29.7	31.4	33.0	17
18	24.1	25.9	27.8	29.6	31.5	33.3	35.2	37.0	18
19	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	19
20	+29.7	+32.0	+34.3	+36.6	+38.8	+41.1	+43.4	+45.7	20
21	32.7	35.3	37.8	40.3	42.8	45.3	47.9	50.4	21
22	35.9	38.7	41.5	44.2	47.0	49.8	52.5	55.3	22
23	39.3	42.3	45.3	48.3	51.4	54.4	57.4	60.4	23
24	42.8	46.0	49.3	52.6	55.9	59.2	62.5	65.8	24
25	+46.4	+49.9	+53.5	+57.1	+60.7	+64.2	+37.8	+71.4	25

* Sidereal time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS, 1923, FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1923, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between either of the observed times above mentioned and upper or lower culmination, as the case may be, is given at ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

ζ URSÆ MAJORIS (MIZAR). (Upper culmination of Polaris.)							δ CASSIOPEIÆ. (Lower culmination of Polaris.)						
Lat. Date.		40°	45°	50°	55°	60°	Lat. Date.		35°	40°	45°	50°	55°
Jan.	1	m s 12 35	m s 12 32	m s 12 30	m s 12 26	m s 12 22	Jan.	1	m s 13 47	m s 13 49	m s 13 52	m s 13 55	m s 13 59
	11	12 24	12 22	12 20	12 15	12 11		11	13 36	13 38	13 41	13 44	13 47
	21	12 13	12 10	12 8	12 4	12 0		21	13 25	13 27	13 29	13 32	13 36
Feb.	31	12 2	11 59	11 57	11 53	11 49	Feb.	31	13 13	13 15	13 18	13 21	13 24
	10	11 51	11 49	11 46	11 43	11 38		10	13 2	13 4	13 7	13 10	13 13
	20	11 41	11 39	11 36	11 33	11 29		20	12 52	12 54	12 57	13 0	13 3
Mar.	2	11 32	11 30	11 28	11 24	11 20	Mar.	2	12 44	12 46	12 48	12 51	12 54
June	30	12 10	12 8	12 5	12 2	11 57		12	12 37	12 39	12 41	12 44	12 47
July	10	12 21	12 19	12 16	12 12	12 8	Apr.	22	12 31	12 33	12 36	12 39	12 42
	20	12 32	12 30	12 27	12 23	12 19		1	12 28	12 30	12 33	12 35	12 39
	30	12 43	12 41	12 38	12 34	12 30		11	12 27	12 29	12 32	12 34	12 38
Aug.	9	12 53	12 51	12 48	12 44	12 40	May	21	12 28	12 30	12 33	12 36	12 39
	19	13 3	13 0	12 58	12 54	12 49		1	12 32	12 34	12 36	12 39	12 42
	29	13 12	13 9	13 6	13 3	12 58		11	12 37	12 39	12 41	12 44	12 47
Sept.	8	13 20	13 17	13 14	13 10	13 6	June	21	12 43	12 45	12 48	12 51	12 54
	18	13 26	13 24	13 20	13 17	13 12		31	12 52	12 54	12 56	12 59	13 2
	28	13 31	13 29	13 25	13 22	13 17		10	13 1	13 3	13 5	13 8	13 12
Oct.	8	13 35	13 32	13 29	13 25	13 20	July	20	13 11	13 13	13 16	13 19	13 22
	18	13 37	13 34	13 31	13 27	13 22		30	13 22	13 24	13 27	13 30	13 33
	28	13 37	13 34	13 31	13 27	13 23		10	13 33	13 35	13 38	13 41	13 45
Nov.	7	13 35	13 33	13 30	13 26	13 21		20	13 45	13 47	13 49	13 52	13 56
	17	13 32	13 30	13 26	13 23	13 18		30	13 56	13 58	14 0	14 3	14 7
	27	13 27	13 24	13 21	13 18	13 13		Nov.	27	14 40	14 43	14 46	14 49	14 53
Dec.	7	13 20	13 17	13 14	13 11	13 6	Dec.	7	14 33	14 36	14 38	14 42	14 46
	17	13 12	13 9	13 6	13 3	12 58		17	14 25	14 27	14 30	14 33	14 37
	27	13 2	13 0	12 57	12 53	12 48		27	14 15	14 17	14 20	14 23	14 27
	31	12 58	12 56	12 53	12 49	12 44		31	14 11	14 13	14 16	14 19	14 23

APPARENT PLACE, TIME OF UPPER CULMINATION, AND TIME INTERVAL BETWEEN UPPER CULMINATION AND ELONGATION EAST OR WEST, OF POLARIS, 1923.

The local mean time of culmination on any meridian for a given date is found by taking from the following table the *Mean Time* of the nearest Greenwich culmination, and applying to it the product of the *Var. per Day* by the integral number of intervening days, this product being numerically additive for an earlier date and subtractive for a later date than that given in the table; and by applying also the product of the *Var. per Hour* by the longitude from Greenwich expressed in hours and fractions of an hour, this product being numerically additive for East longitudes and subtractive for West longitudes.

The time interval between upper and lower culmination is 12^h diminished by one-half the numerical value of the *Var. per Day*.

The last column below applies to all meridians.

Date.	Upper Culmination, Meridian of Greenwich.					Latitude.	Mean Time Interval, Elongation minus Upper Culm.
	Apparent Right Ascension.	Apparent Declination.	Mean Time.	Var. per Day.	Var. per Hour.		
	h m 1 32	° ' +88 53					
	s	"	h m s	m s	W. E.	°	W. E.
Jan. 1	119	49.8	6 52 24	-3 57.0	-9.87+	10	+5 58.2-
11	108	50.8	6 12 54	3 57.0	9.88	12	5 58.1
21	97	51.1	5 33 24	3 57.0	9.88	14	5 57.9
31	86	50.8	4 53 53	3 57.0	9.88	16	5 57.7
Feb. 10	75	49.9	4 14 24	3 56.9	9.87	18	5 57.6
20	65	48.3	3 34 55	-3 56.8	-9.87+	20	+5 57.4-
Mar. 2	56	46.2	2 55 27	3 56.7	9.86	22	5 57.2
12	49	43.7	2 16 1	3 56.5	9.85	24	5 57.1
22	44	40.8	1 36 36	3 56.3	9.85	26	5 56.9
Apr. 1	41	37.8	0 57 14	3 56.1	9.84	28	5 56.7
11	40	34.6	0 17 54	-3 55.9	-9.83+	30	+5 56.5-
20	41	31.5	23 38 36	3 55.7	9.82	32	5 56.3
30	44	28.5	22 59 20	3 55.5	9.81	34	5 56.0
May 10	49	25.8	22 20 6	3 55.3	9.80	36	5 55.8
20	56	23.4	21 40 54	3 55.2	9.80	38	5 55.6
30	64	21.4	21 1 43	-3 55.0	-9.79+	40	+5 55.3-
June 9	73	19.9	20 22 33	3 54.9	9.79	42	5 55.0
19	84	18.9	19 43 24	3 54.9	9.79	44	5 54.8
29	94	18.5	19 4 16	3 54.8	9.78	46	5 54.4
July 9	106	18.6	18 25 8	3 54.8	9.78	48	5 54.1
19	117	19.2	17 46 0	-3 54.8	-9.78+	50	+5 53.8-
29	128	20.4	17 6 52	3 54.8	9.78	52	5 53.4
Aug. 8	139	22.0	16 27 44	3 54.9	9.79	54	5 52.9
18	149	24.1	15 48 34	3 55.0	9.79	56	5 52.5
28	158	26.7	15 9 24	3 55.0	9.79	58	5 52.0
Sept. 7	166	29.6	14 30 13	-3 55.2	-9.80+	60	+5 51.4-
17	172	32.8	13 51 1	3 55.3	9.80	62	5 50.7
27	178	36.3	13 11 47	3 55.4	9.81	64	5 50.0
Oct. 7	182	39.9	12 32 32	3 55.6	9.82	66	5 49.1
17	184	43.7	11 53 15	3 55.8	9.82	68	5 48.1
27	184	47.4	11 13 57	-3 56.0	-9.83+	70	+5 46.9-
Nov. 6	183	51.1	10 34 36	3 56.1	9.84		
16	180	54.7	9 55 14	3 56.3	9.85		
26	175	58.0	9 15 50	3 56.5	9.85		
Dec. 6	168	60.9	8 36 24	3 56.7	9.86		
16	160	63.5	7 56 57	-3 56.8	-9.87+		
26	150	65.5	7 17 28	-3 56.9	-9.87+		

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Jan. 0	h m 17 59	h m 18 17	h m 18 35	h m 18 56	h m 19 8	h m 19 22	h m 19 38	h m 19 59	h m 20 8	h m 20 19	h m 20 32	h m 20 46	h m 21 3
1	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 32	20 46	21 3
2	18 0	18 18	18 36	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 31	20 46	21 2
3	18 1	18 18	18 36	18 57	19 9	19 22	19 39	19 59	20 8	20 19	20 31	20 45	21 2
4	18 1	18 18	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 1
5	18 2	18 19	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 0
6	18 2	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 18	20 30	20 43	20 59
7	18 3	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 17	20 29	29 42	20 58
8	18 3	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	29 42	20 57
9	18 4	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	20 41	20 56
10	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 15	20 27	20 40	20 55
11	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 14	20 26	20 39	20 54
12	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 55	20 4	20 14	20 25	20 38	20 52
13	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 3	20 13	20 24	20 36	20 51
14	18 6	18 21	18 38	18 57	19 8	19 21	19 36	19 54	20 2	20 12	20 23	20 35	20 50
15	18 6	18 21	18 38	18 57	19 8	19 20	19 35	19 53	20 2	20 11	20 22	20 34	20 48
16	18 6	18 22	18 38	18 57	19 8	19 20	19 34	19 52	20 1	20 10	20 21	20 33	20 47
17	18 7	18 22	18 38	18 56	19 7	19 19	19 34	19 51	20 0	20 9	20 19	20 31	20 45
18	18 7	18 22	18 38	18 56	19 7	19 19	19 33	19 50	19 59	20 8	20 18	20 30	20 43
19	18 7	18 22	18 38	18 56	19 6	19 18	19 32	19 49	19 58	20 6	20 17	20 28	20 42
20	18 8	18 22	18 38	18 56	19 6	19 18	19 32	19 48	19 57	20 5	20 15	20 27	20 40
21	18 8	18 22	18 38	18 56	19 6	19 17	19 31	19 47	19 56	20 4	20 14	20 25	20 38
22	18 8	18 23	18 38	18 55	19 5	19 17	19 30	19 46	19 54	20 3	20 12	20 23	20 36
23	18 8	18 23	18 38	18 55	19 5	19 16	19 29	19 45	19 53	20 1	20 11	20 22	20 34
24	18 9	18 23	18 38	18 54	19 4	19 15	19 28	19 44	19 52	20 0	20 9	20 20	20 32
25	18 9	18 23	18 37	18 54	19 4	19 15	19 28	19 43	19 50	19 59	20 8	20 18	20 30
26	18 9	18 23	18 37	18 54	19 3	19 14	19 27	19 42	19 49	19 57	20 6	20 16	20 28
27	18 9	18 23	18 37	18 53	19 2	19 13	19 26	19 41	19 48	19 56	20 4	20 14	20 26
28	18 10	18 23	18 37	18 53	19 2	19 12	19 25	19 40	19 46	19 54	20 3	20 12	20 24
29	18 10	18 23	18 36	18 52	19 1	19 12	19 24	19 38	19 45	19 52	20 1	20 10	20 21
30	18 10	18 23	18 36	18 52	19 0	19 11	19 22	19 37	19 43	19 51	19 59	20 8	20 19
Feb. 1	18 10	18 23	18 36	18 51	19 0	19 10	19 21	19 35	19 42	19 49	19 57	20 6	20 17
2	18 10	18 22	18 36	18 50	18 59	19 9	19 20	19 34	19 40	19 47	19 55	20 4	20 14
3	18 10	18 22	18 35	18 50	18 58	19 8	19 19	19 32	19 39	19 46	19 53	20 2	20 12
4	18 10	18 22	18 35	18 49	18 58	19 7	19 18	19 31	19 37	19 44	19 51	20 0	20 10
5	18 10	18 22	18 35	18 49	18 57	19 6	19 17	19 30	19 36	19 42	19 49	19 58	20 7
6	18 11	18 22	18 34	18 48	18 56	19 5	19 15	19 28	19 34	19 40	19 47	19 56	20 5
7	18 11	18 22	18 34	18 47	18 55	19 4	19 14	19 26	19 32	19 38	19 45	19 53	20 2
8	18 11	18 22	18 33	18 47	18 54	19 3	19 13	19 25	19 30	19 36	19 43	19 51	20 0
9	18 11	18 22	18 33	18 46	18 53	19 2	19 11	19 23	19 28	19 34	19 41	19 49	19 57
10	18 11	18 21	18 32	18 45	18 52	19 0	19 10	19 22	19 27	19 33	19 39	19 46	19 55
11	18 11	18 21	18 32	18 44	18 51	18 59	19 9	19 20	19 25	19 31	19 37	19 44	19 52
12	18 11	18 21	18 32	18 44	18 50	18 58	19 7	19 18	19 23	19 28	19 35	19 42	19 49
13	18 11	18 21	18 31	18 43	18 49	18 57	19 6	19 16	19 21	19 26	19 32	19 39	19 47
14	18 11	18 20	18 30	18 42	18 48	18 56	19 4	19 15	19 19	19 24	19 30	19 37	19 44
15	18 11	18 20	18 30	18 41	18 47	18 54	19 3	19 13	19 17	19 22	19 28	19 34	19 41
16	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39

TABLE VIII.

711

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.	1	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 48	3 35	3 21	3 4
	2	6 8	5 51	5 32	5 12	5 0	4 46	4 29	4 9	3 59	3 49	3 36	3 22	3 5
	3	6 8	5 51	5 33	5 12	5 0	4 46	4 30	4 10	4 0	3 50	3 38	3 24	3 7
	4	6 8	5 51	5 34	5 13	5 1	4 47	4 31	4 11	4 2	3 51	3 39	3 25	3 8
	5	6 9	5 52	5 34	5 14	5 2	4 48	4 32	4 12	4 3	3 52	3 40	3 26	3 10
	6	6 9	5 53	5 35	5 14	5 3	4 49	4 33	4 13	4 4	3 54	3 42	3 28	3 12
	7	6 10	5 53	5 36	5 15	5 4	4 50	4 34	4 14	4 5	3 55	3 43	3 30	3 14
	8	6 10	5 54	5 36	5 16	5 4	4 51	4 35	4 16	4 7	3 56	3 45	3 31	3 15
	9	6 11	5 54	5 37	5 17	5 5	4 52	4 36	4 17	4 8	3 58	3 46	3 33	3 17
	10	6 11	5 55	5 38	5 18	5 6	4 53	4 38	4 18	4 9	3 59	3 48	3 35	3 19
	11	6 12	5 55	5 38	5 18	5 7	4 54	4 39	4 20	4 11	4 1	3 50	3 36	3 21
	12	6 12	5 56	5 39	5 19	5 8	4 55	4 40	4 21	4 12	4 2	3 51	3 38	3 23
	13	6 12	5 56	5 39	5 20	5 9	4 56	4 41	4 22	4 14	4 4	3 53	3 40	3 26
	14	6 13	5 57	5 40	5 21	5 10	4 57	4 42	4 24	4 15	4 6	3 55	3 42	3 28
	15	6 13	5 57	5 41	5 22	5 11	4 58	4 43	4 25	4 17	4 7	3 56	3 44	3 30
	16	6 13	5 58	5 41	5 23	5 12	4 59	4 45	4 27	4 18	4 9	3 58	3 46	3 32
	17	6 14	5 58	5 42	5 24	5 13	5 0	4 46	4 28	4 20	4 11	4 0	3 48	3 34
	18	6 14	5 59	5 43	5 24	5 14	5 2	4 47	4 30	4 22	4 12	4 2	3 50	3 37
	19	6 14	5 59	5 43	5 25	5 15	5 3	4 49	4 31	4 23	4 14	4 4	3 52	3 39
	20	6 14	6 0	5 44	5 26	5 16	5 4	4 50	4 33	4 25	4 16	4 6	3 55	3 41
	21	6 15	6 0	5 45	5 27	5 17	5 5	4 51	4 34	4 26	4 18	4 8	3 57	3 44
	22	6 15	6 1	5 45	5 28	5 18	5 6	4 52	4 36	4 28	4 20	4 10	3 59	3 46
	23	6 16	6 1	5 46	5 29	5 19	5 7	4 54	4 38	4 30	4 22	4 12	4 1	3 49
	24	6 16	6 2	5 47	5 30	5 20	5 8	4 55	4 39	4 32	4 24	4 14	4 4	3 51
	25	6 16	6 2	5 47	5 30	5 21	5 10	4 57	4 41	4 34	4 25	4 16	4 6	3 54
	26	6 16	6 2	5 48	5 31	5 22	5 11	4 58	4 43	4 35	4 27	4 18	4 8	3 56
	27	6 16	6 3	5 48	5 32	5 23	5 12	4 59	4 44	4 37	4 29	4 20	4 10	3 59
	28	6 17	6 3	5 49	5 33	5 24	5 13	5 1	4 46	4 39	4 31	4 22	4 13	4 1
	29	6 17	6 4	5 50	5 34	5 25	5 14	5 2	4 48	4 41	4 33	4 24	4 15	4 4
	30	6 17	6 4	5 50	5 35	5 26	5 16	5 4	4 49	4 42	4 35	4 27	4 17	4 6
Feb.	31	6 17	6 4	5 51	5 36	5 27	5 17	5 5	4 51	4 44	4 37	4 29	4 20	4 9
	1	6 17	6 5	5 52	5 36	5 28	5 18	5 6	4 53	4 46	4 39	4 31	4 22	4 12
	2	6 17	6 5	5 52	5 37	5 29	5 19	5 8	4 54	4 48	4 41	4 33	4 24	4 14
	3	6 18	6 5	5 53	5 38	5 30	5 20	5 9	4 56	4 50	4 43	4 35	4 27	4 17
	4	6 18	6 6	5 53	5 39	5 31	5 22	5 11	4 58	4 52	4 45	4 38	4 29	4 20
	5	6 18	6 6	5 54	5 40	5 32	5 23	5 12	5 0	4 54	4 47	4 40	4 32	4 22
	6	6 18	6 6	5 54	5 41	5 33	5 24	5 14	5 1	4 55	4 49	4 42	4 34	4 25
	7	6 18	6 7	5 55	5 42	5 34	5 25	5 15	5 3	4 57	4 51	4 44	4 36	4 28
	8	6 18	6 7	5 55	5 42	5 35	5 26	5 16	5 5	4 59	4 53	4 46	4 39	4 30
	9	6 18	6 7	5 56	5 43	5 36	5 28	5 18	5 6	5 1	4 55	4 49	4 41	4 33
	10	6 18	6 8	5 56	5 44	5 37	5 29	5 19	5 8	5 3	4 57	4 51	4 44	4 35
	11	6 18	6 8	5 57	5 45	5 38	5 30	5 21	5 10	5 5	4 59	4 53	4 46	4 38
	12	6 18	6 8	5 58	5 46	5 39	5 31	5 22	5 12	5 7	5 1	4 55	4 48	4 41
	13	6 18	6 8	5 58	5 46	5 40	5 32	5 24	5 13	5 8	5 3	4 57	4 51	4 43
	14	6 18	6 8	5 58	5 47	5 41	5 34	5 25	5 15	5 10	5 5	5 0	4 53	4 46
	15	6 18	6 8	5 59	5 48	5 42	5 35	5 26	5 17	5 12	5 7	5 2	4 56	4 49
	16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 15	18 11	18 20	18 29	18 40	18 46	18 53	19 1	19 11	19 15	19 20	19 26	19 32	19 39
16	18 11	18 20	18 29	18 39	18 45	18 52	19 0	19 9	19 14	19 18	19 23	19 29	19 36
17	18 11	18 19	18 28	18 38	18 44	18 51	18 58	19 7	19 12	19 16	19 21	19 27	19 33
18	18 11	18 19	18 28	18 37	18 43	18 49	18 57	19 5	19 10	19 14	19 19	19 24	19 30
19	18 10	18 19	18 27	18 36	18 42	18 48	18 55	19 4	19 7	19 12	19 16	19 22	19 28
20	18 10	18 18	18 26	18 36	18 41	18 47	18 54	19 2	19 5	19 10	19 14	19 19	19 25
21	18 10	18 18	18 26	18 35	18 40	18 45	18 52	19 0	19 3	19 7	19 12	19 17	19 22
22	18 10	18 17	18 25	18 34	18 38	18 44	18 50	18 58	19 1	19 5	19 9	19 14	19 19
23	18 10	18 17	18 24	18 33	18 37	18 42	18 48	18 56	18 59	19 3	19 7	19 11	19 16
24	18 10	18 17	18 24	18 32	18 36	18 41	18 47	18 54	18 57	19 0	19 4	19 9	19 14
25	18 10	18 16	18 23	18 30	18 35	18 40	18 45	18 52	18 55	18 58	19 2	19 6	19 11
26	18 10	18 16	18 22	18 29	18 34	18 38	18 44	18 50	18 53	18 56	18 59	19 3	19 8
27	18 9	18 15	18 22	18 28	18 32	18 37	18 42	18 48	18 51	18 54	18 57	19 1	19 5
28	18 9	18 15	18 21	18 27	18 31	18 35	18 40	18 46	18 48	18 51	18 54	18 58	19 2
Mar. 1	18 9	18 14	18 20	18 26	18 30	18 34	18 38	18 44	18 46	18 49	18 52	18 55	18 59
2	18 9	18 14	18 19	18 25	18 28	18 32	18 37	18 42	18 44	18 47	18 49	18 53	18 56
3	18 9	18 14	18 18	18 24	18 27	18 31	18 35	18 40	18 42	18 44	18 47	18 50	18 53
4	18 8	18 13	18 18	18 23	18 26	18 29	18 33	18 38	18 40	18 42	18 44	18 47	18 50
5	18 8	18 12	18 17	18 22	18 25	18 28	18 31	18 36	18 37	18 40	18 42	18 44	18 47
6	18 8	18 12	18 16	18 21	18 23	18 26	18 30	18 33	18 35	18 37	18 39	18 42	18 44
7	18 8	18 12	18 15	18 20	18 22	18 25	18 28	18 31	18 33	18 35	18 37	18 39	18 41
8	18 8	18 11	18 14	18 18	18 20	18 23	18 26	18 29	18 30	18 32	18 34	18 36	18 38
9	18 7	18 10	18 14	18 17	18 19	18 21	18 24	18 27	18 28	18 30	18 31	18 33	18 35
10	18 7	18 10	18 13	18 16	18 18	18 20	18 22	18 25	18 26	18 27	18 29	18 30	18 32
11	18 7	18 9	18 12	18 15	18 16	18 18	18 20	18 23	18 24	18 25	18 26	18 28	18 29
12	18 6	18 9	18 11	18 14	18 15	18 17	18 18	18 20	18 21	18 22	18 24	18 25	18 26
13	18 6	18 8	18 10	18 13	18 14	18 15	18 17	18 18	18 19	18 20	18 21	18 22	18 23
14	18 6	18 8	18 9	18 11	18 12	18 14	18 15	18 16	18 17	18 18	18 18	18 19	18 20
15	18 6	18 7	18 9	18 10	18 11	18 12	18 13	18 14	18 15	18 15	18 16	18 16	18 17
16	18 5	18 6	18 8	18 9	18 10	18 10	18 11	18 12	18 12	18 13	18 13	18 14	18 14
17	18 5	18 6	18 7	18 8	18 8	18 9	18 9	18 10	18 10	18 10	18 11	18 11	18 11
18	18 5	18 5	18 6	18 7	18 7	18 7	18 7	18 8	18 8	18 8	18 8	18 8	18 8
19	18 4	18 5	18 5	18 5	18 5	18 6	18 5	18 5	18 5	18 5	18 5	18 5	18 5
20	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 3	18 3	18 3	18 3	18 2	18 2
21	18 4	18 4	18 3	18 3	18 3	18 2	18 2	18 1	18 1	18 0	18 0	18 0	17 59
22	18 4	18 3	18 2	18 2	18 1	18 1	18 0	17 59	17 58	17 58	17 57	17 57	17 56
23	18 3	18 2	18 2	18 0	18 0	17 59	17 58	17 57	17 56	17 55	17 55	17 54	17 53
24	18 3	18 2	18 1	17 59	17 58	17 57	17 56	17 54	17 54	17 53	17 52	17 51	17 50
25	18 3	18 1	18 0	17 58	17 57	17 56	17 54	17 52	17 52	17 50	17 50	17 48	17 47
26	18 2	18 1	17 59	17 57	17 56	17 54	17 52	17 50	17 49	17 48	17 47	17 46	17 44
27	18 2	18 0	17 58	17 56	17 54	17 52	17 50	17 48	17 47	17 46	17 44	17 43	17 41
28	18 2	18 0	17 57	17 54	17 53	17 51	17 49	17 46	17 44	17 43	17 41	17 40	17 38
29	18 2	17 59	17 56	17 53	17 51	17 49	17 47	17 44	17 42	17 41	17 39	17 37	17 35
30	18 1	17 58	17 56	17 52	17 50	17 48	17 45	17 41	17 40	17 38	17 36	17 34	17 32
31	18 1	17 58	17 55	17 51	17 48	17 46	17 43	17 39	17 38	17 36	17 34	17 31	17 29
Apr. 1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23

TABLE VIII.

713

LOCAL, ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time; write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 4	4 58	4 51
17	6 18	6 9	6 0	5 50	5 44	5 37	5 29	5 20	5 16	5 11	5 6	5 0	4 54
18	6 18	6 9	6 0	5 50	5 45	5 38	5 31	5 22	5 18	5 13	5 8	5 3	4 56
19	6 18	6 9	6 1	5 51	5 46	5 40	5 32	5 24	5 20	5 15	5 10	5 5	4 59
20	6 17	6 10	6 1	5 52	5 47	5 41	5 34	5 25	5 22	5 17	5 13	5 7	5 2
21	6 17	6 10	6 2	5 53	5 48	5 42	5 35	5 27	5 23	5 19	5 15	5 10	5 4
22	6 17	6 10	6 2	5 53	5 48	5 43	5 36	5 29	5 25	5 21	5 17	5 12	5 7
23	6 17	6 10	6 3	5 54	5 49	5 44	5 38	5 30	5 27	5 23	5 19	5 14	5 9
24	6 17	6 10	6 3	5 55	5 50	5 45	5 39	5 32	5 29	5 25	5 21	5 17	5 12
25	6 17	6 10	6 3	5 56	5 51	5 46	5 40	5 34	5 31	5 27	5 23	5 19	5 14
26	6 17	6 10	6 4	5 56	5 52	5 47	5 42	5 35	5 32	5 29	5 26	5 22	5 17
27	6 16	6 10	6 4	5 57	5 53	5 49	5 43	5 37	5 34	5 31	5 28	5 24	5 20
28	6 16	6 10	6 4	5 58	5 54	5 50	5 44	5 39	5 36	5 33	5 30	5 26	5 22
Mar. 1	6 16	6 10	6 5	5 58	5 55	5 51	5 46	5 40	5 38	5 35	5 32	5 28	5 25
2	6 16	6 10	6 5	5 59	5 56	5 52	5 47	5 42	5 40	5 37	5 34	5 31	5 27
3	6 16	6 11	6 6	6 0	5 56	5 53	5 49	5 44	5 42	5 39	5 36	5 33	5 30
4	6 15	6 11	6 6	6 0	5 57	5 54	5 50	5 45	5 43	5 41	5 38	5 35	5 32
5	6 15	6 11	6 6	6 1	5 58	5 55	5 51	5 47	5 45	5 43	5 40	5 38	5 35
6	6 15	6 11	6 7	6 2	5 59	5 56	5 53	5 49	5 47	5 45	5 43	5 40	5 37
7	6 15	6 11	6 7	6 3	6 0	5 57	5 54	5 50	5 49	5 47	5 45	5 42	5 40
8	6 14	6 11	6 7	6 3	6 1	5 58	5 55	5 52	5 50	5 49	5 47	5 45	5 42
9	6 14	6 11	6 8	6 4	6 2	5 59	5 57	5 54	5 52	5 51	5 49	5 47	5 45
10	6 14	6 11	6 8	6 4	6 2	6 0	5 58	5 55	5 54	5 52	5 51	5 49	5 47
11	6 14	6 11	6 8	6 5	6 3	6 1	5 59	5 57	5 56	5 54	5 53	5 51	5 50
12	6 13	6 11	6 8	6 6	6 4	6 2	6 1	5 58	5 57	5 56	5 55	5 54	5 52
13	6 13	6 11	6 9	6 6	6 5	6 4	6 2	6 0	5 59	5 58	5 57	5 56	5 55
14	6 13	6 11	6 9	6 7	6 6	6 5	6 3	6 2	6 1	6 0	5 59	5 58	5 57
15	6 13	6 11	6 10	6 8	6 7	6 6	6 5	6 3	6 3	6 2	6 1	6 1	6 0
16	6 12	6 11	6 10	6 8	6 8	6 7	6 6	6 5	6 4	6 4	6 3	6 3	6 2
17	6 12	6 11	6 10	6 9	6 8	6 8	6 7	6 6	6 6	6 6	6 5	6 5	6 4
18	6 12	6 11	6 10	6 10	6 9	6 9	6 8	6 8	6 8	6 8	6 8	6 7	6 7
19	6 12	6 11	6 11	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 10	6 9
20	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 12
21	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 13	6 13	6 13	6 14	6 14	6 14
22	6 10	6 11	6 11	6 12	6 12	6 12	6 13	6 14	6 15	6 15	6 16	6 16	6 17
23	6 10	6 11	6 12	6 13	6 13	6 14	6 15	6 16	6 16	6 17	6 18	6 18	6 19
24	6 10	6 11	6 12	6 13	6 14	6 15	6 16	6 18	6 18	6 19	6 20	6 21	6 22
25	6 10	6 11	6 12	6 14	6 15	6 16	6 17	6 19	6 20	6 21	6 22	6 23	6 24
26	6 9	6 11	6 12	6 14	6 16	6 17	6 19	6 21	6 22	6 23	6 24	6 25	6 26
27	6 9	6 11	6 13	6 15	6 16	6 18	6 20	6 22	6 23	6 25	6 26	6 27	6 29
28	6 9	6 11	6 13	6 16	6 17	6 19	6 21	6 24	6 25	6 26	6 28	6 30	6 31
29	6 8	6 11	6 13	6 16	6 18	6 20	6 22	6 25	6 27	6 28	6 30	6 32	6 34
30	6 8	6 11	6 14	6 17	6 19	6 21	6 24	6 27	6 28	6 30	6 32	6 34	6 36
31	6 8	6 11	6 14	6 18	6 20	6 22	6 25	6 28	6 30	6 32	6 34	6 36	6 39
Apr. 1	6 8	6 11	6 14	6 18	6 20	6 23	6 26	6 30	6 32	6 34	6 36	6 38	6 41
2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 46

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	1	18 1	17 57	17 54	17 50	17 47	17 44	17 41	17 37	17 35	17 33	17 31	17 28	17 26
	2	18 0	17 57	17 53	17 48	17 46	17 43	17 39	17 35	17 33	17 31	17 28	17 26	17 23
	3	18 0	17 56	17 52	17 47	17 44	17 41	17 37	17 33	17 31	17 28	17 26	17 23	17 20
	4	18 0	17 56	17 51	17 46	17 43	17 40	17 35	17 30	17 28	17 26	17 23	17 20	17 17
	5	17 59	17 55	17 50	17 45	17 42	17 38	17 34	17 28	17 26	17 23	17 20	17 17	17 14
	6	17 59	17 54	17 50	17 44	17 40	17 36	17 32	17 26	17 24	17 21	17 18	17 14	17 10
	7	17 59	17 54	17 49	17 42	17 39	17 35	17 30	17 24	17 22	17 18	17 15	17 12	17 7
	8	17 58	17 53	17 48	17 41	17 38	17 33	17 28	17 22	17 19	17 16	17 13	17 9	17 4
	9	17 58	17 53	17 47	17 41	17 36	17 32	17 26	17 20	17 17	17 14	17 10	17 6	17 2
	10	17 58	17 52	17 46	17 39	17 35	17 30	17 24	17 18	17 15	17 11	17 8	17 3	16 59
	11	17 58	17 52	17 45	17 38	17 34	17 29	17 23	17 16	17 12	17 9	17 5	17 1	16 56
	12	17 57	17 51	17 45	17 37	17 32	17 27	17 21	17 14	17 10	17 7	17 2	16 58	16 53
	13	17 57	17 51	17 44	17 36	17 31	17 26	17 19	17 12	17 8	17 4	17 0	16 55	16 50
	14	17 57	17 50	17 43	17 34	17 30	17 24	17 17	17 10	17 6	17 2	16 57	16 52	16 47
	15	17 57	17 50	17 42	17 33	17 28	17 22	17 16	17 8	17 4	17 0	16 55	16 50	16 44
	16	17 56	17 49	17 41	17 32	17 27	17 21	17 14	17 5	17 1	16 57	16 52	16 47	16 41
	17	17 56	17 49	17 41	17 31	17 26	17 20	17 12	17 3	16 59	16 55	16 50	16 44	16 38
	18	17 56	17 48	17 40	17 30	17 24	17 18	17 10	17 1	16 57	16 52	16 47	16 42	16 35
	19	17 56	17 48	17 39	17 29	17 23	17 16	17 9	16 59	16 55	16 50	16 45	16 39	16 32
	20	17 55	17 47	17 38	17 28	17 22	17 15	17 7	16 57	16 53	16 48	16 42	16 36	16 29
	21	17 55	17 47	17 38	17 27	17 21	17 14	17 5	16 55	16 51	16 46	16 40	16 34	16 26
	22	17 55	17 46	17 37	17 26	17 20	17 12	17 4	16 53	16 49	16 43	16 37	16 31	16 23
	23	17 55	17 46	17 36	17 25	17 18	17 11	17 2	16 51	16 46	16 41	16 35	16 28	16 20
	24	17 55	17 45	17 35	17 24	17 17	17 10	17 0	16 50	16 44	16 39	16 33	16 26	16 18
	25	17 54	17 45	17 35	17 23	17 16	17 8	16 59	16 48	16 42	16 37	16 30	16 23	16 15
	26	17 54	17 45	17 34	17 22	17 15	17 7	16 57	16 46	16 40	16 34	16 28	16 20	16 12
	27	17 54	17 44	17 33	17 21	17 14	17 5	16 56	16 44	16 38	16 32	16 25	16 18	16 9
	28	17 54	17 44	17 33	17 20	17 13	17 4	16 54	16 42	16 36	16 30	16 23	16 15	16 6
	29	17 54	17 43	17 32	17 19	17 11	17 3	16 52	16 40	16 34	16 28	16 21	16 13	16 4
	30	17 54	17 43	17 32	17 18	17 10	17 2	16 51	16 38	16 32	16 26	16 18	16 10	16 1
May	1	17 54	17 43	17 31	17 17	17 9	17 0	16 50	16 37	16 30	16 24	16 16	16 8	15 58
	2	17 54	17 42	17 30	17 16	17 8	16 59	16 48	16 35	16 29	16 22	16 14	16 5	15 55
	3	17 53	17 42	17 30	17 16	17 7	16 58	16 46	16 33	16 27	16 20	16 12	16 3	15 53
	4	17 53	17 42	17 29	17 15	17 6	16 57	16 45	16 31	16 25	16 18	16 10	16 0	15 50
	5	17 53	17 41	17 28	17 14	17 5	16 55	16 44	16 30	16 23	16 16	16 7	15 58	15 47
	6	17 53	17 41	17 28	17 13	17 4	16 54	16 42	16 28	16 21	16 14	16 5	15 56	15 45
	7	17 53	17 41	17 28	17 12	17 3	16 53	16 41	16 26	16 19	16 12	16 3	15 53	15 42
	8	17 53	17 40	17 27	17 11	17 2	16 52	16 40	16 25	16 18	16 10	16 1	15 51	15 40
	9	17 53	17 40	17 26	17 11	17 1	16 51	16 38	16 23	16 16	16 8	15 59	15 49	15 37
	10	17 53	17 40	17 26	17 10	17 0	16 50	16 37	16 22	16 14	16 6	15 57	15 46	15 34
	11	17 53	17 40	17 26	17 9	17 0	16 49	16 36	16 20	16 12	16 4	15 55	15 44	15 32
	12	17 53	17 40	17 26	17 9	16 59	16 48	16 34	16 18	16 11	16 2	15 53	15 42	15 29
	13	17 53	17 39	17 25	17 8	16 58	16 47	16 33	16 17	16 9	16 1	15 51	15 40	15 27
	14	17 53	17 39	17 24	17 7	16 57	16 46	16 32	16 16	16 8	15 59	15 49	15 38	15 25
	15	17 53	17 39	17 24	17 7	16 56	16 45	16 31	16 14	16 6	15 57	15 47	15 36	15 22
	16	17 53	17 39	17 24	17 6	16 56	16 44	16 30	16 13	16 5	15 56	15 45	15 34	15 20
	17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18

TABLE VIII.

715

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	2	6 7	6 10	6 14	6 19	6 21	6 24	6 28	6 32	6 34	6 36	6 38	6 41	6 44
	3	6 7	6 10	6 15	6 19	6 22	6 25	6 29	6 33	6 35	6 38	6 40	6 43	6 46
	4	6 7	6 10	6 15	6 20	6 23	6 26	6 30	6 35	6 37	6 40	6 42	6 45	6 48
	5	6 6	6 10	6 15	6 20	6 24	6 27	6 31	6 36	6 39	6 41	6 44	6 47	6 51
	6	6 6	6 10	6 15	6 21	6 24	6 28	6 33	6 38	6 40	6 43	6 46	6 50	6 53
	7	6 6	6 10	6 16	6 22	6 25	6 29	6 34	6 39	6 42	6 45	6 48	6 52	6 56
	8	6 6	6 10	6 16	6 22	6 26	6 30	6 35	6 41	6 44	6 47	6 50	6 54	6 58
	9	6 5	6 10	6 16	6 23	6 27	6 31	6 36	6 43	6 46	6 49	6 52	6 56	7 1
	10	6 5	6 10	6 16	6 24	6 28	6 32	6 38	6 44	6 47	6 50	6 54	6 58	7 3
	11	6 5	6 10	6 17	6 24	6 28	6 33	6 39	6 46	6 49	6 52	6 56	7 1	7 6
	12	6 4	6 10	6 17	6 25	6 29	6 34	6 40	6 47	6 51	6 54	6 58	7 3	7 8
	13	6 4	6 10	6 17	6 25	6 30	6 35	6 42	6 49	6 52	6 56	7 0	7 5	7 10
	14	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 50	6 54	6 58	7 2	7 7	7 13
	15	6 4	6 10	6 18	6 26	6 32	6 37	6 44	6 52	6 56	7 0	7 4	7 9	7 15
	16	6 3	6 10	6 18	6 27	6 32	6 38	6 45	6 54	6 58	7 2	7 6	7 12	7 18
	17	6 3	6 10	6 18	6 28	6 33	6 39	6 46	6 55	6 59	7 4	7 8	7 14	7 20
	18	6 3	6 10	6 19	6 28	6 34	6 40	6 48	6 57	7 1	7 5	7 10	7 16	7 23
	19	6 3	6 11	6 19	6 29	6 35	6 41	6 49	6 58	7 3	7 7	7 12	7 18	7 25
	20	6 2	6 11	6 19	6 30	6 36	6 42	6 50	7 0	7 4	7 9	7 14	7 21	7 28
	21	6 2	6 11	6 20	6 30	6 36	6 43	6 52	7 1	7 6	7 11	7 17	7 23	7 30
	22	6 2	6 11	6 20	6 31	6 37	6 44	6 53	7 3	7 8	7 13	7 19	7 25	7 33
	23	6 2	6 11	6 20	6 31	6 38	6 45	6 54	7 4	7 9	7 15	7 21	7 27	7 35
	24	6 2	6 11	6 21	6 32	6 39	6 46	6 55	7 6	7 11	7 17	7 23	7 30	7 38
	25	6 2	6 11	6 21	6 33	6 40	6 47	6 57	7 8	7 13	7 18	7 25	7 32	7 40
	26	6 1	6 11	6 21	6 33	6 40	6 48	6 58	7 9	7 14	7 20	7 27	7 34	7 42
	27	6 1	6 11	6 22	6 34	6 41	6 49	6 59	7 11	7 16	7 22	7 29	7 36	7 45
	28	6 1	6 11	6 22	6 35	6 42	6 50	7 0	7 12	7 18	7 24	7 31	7 39	7 47
	29	6 1	6 11	6 22	6 35	6 43	6 51	7 2	7 14	7 19	7 26	7 33	7 41	7 50
	30	6 1	6 11	6 23	6 36	6 44	6 52	7 3	7 15	7 21	7 28	7 35	7 43	7 52
May	1	6 1	6 12	6 23	6 37	6 44	6 53	7 4	7 17	7 23	7 30	7 37	7 45	7 55
	2	6 0	6 12	6 23	6 37	6 45	6 54	7 5	7 18	7 24	7 31	7 39	7 48	7 57
	3	6 0	6 12	6 24	6 38	6 46	6 55	7 7	7 20	7 26	7 33	7 41	7 50	8 0
	4	6 0	6 12	6 24	6 38	6 47	6 56	7 8	7 21	7 28	7 35	7 43	7 52	8 2
	5	6 0	6 12	6 25	6 39	6 48	6 57	7 9	7 23	7 30	7 37	7 45	7 54	8 5
	6	6 0	6 12	6 25	6 40	6 49	6 58	7 10	7 24	7 31	7 39	7 47	7 56	8 7
	7	6 0	6 12	6 25	6 40	6 49	6 59	7 12	7 26	7 33	7 40	7 49	7 58	8 10
	8	6 0	6 12	6 26	6 41	6 50	7 0	7 13	7 28	7 34	7 42	7 51	8 1	8 12
	9	6 0	6 12	6 26	6 42	6 51	7 1	7 14	7 29	7 36	7 44	7 53	8 3	8 15
	10	6 0	6 13	6 26	6 42	6 52	7 2	7 15	7 30	7 38	7 46	7 55	8 5	8 17
	11	6 0	6 13	6 27	6 43	6 53	7 3	7 16	7 32	7 39	7 48	7 57	8 7	8 20
	12	6 0	6 13	6 27	6 44	6 53	7 4	7 17	7 33	7 41	7 49	7 59	8 9	8 22
	13	6 0	6 13	6 28	6 44	6 54	7 5	7 19	7 35	7 42	7 51	8 1	8 12	8 24
	14	6 0	6 13	6 28	6 45	6 55	7 6	7 20	7 36	7 44	7 53	8 2	8 14	8 27
	15	6 0	6 14	6 28	6 46	6 56	7 7	7 21	7 38	7 46	7 54	8 4	8 16	8 29
	16	6 0	6 14	6 29	6 46	6 56	7 8	7 22	7 39	7 47	7 56	8 6	8 18	8 31
	17	6 0	6 14	6 29	6 47	6 57	7 9	7 23	7 40	7 49	7 58	8 8	8 20	8 34
	18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 36

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May	17	17 53	17 38	17 23	17 5	16 55	16 43	16 29	16 11	16 3	15 54	15 44	15 32	15 18
	18	17 53	17 38	17 23	17 5	16 54	16 42	16 28	16 10	16 2	15 52	15 42	15 30	15 16
	19	17 53	17 38	17 22	17 4	16 54	16 41	16 27	16 9	16 0	15 51	15 40	15 28	15 13
	20	17 53	17 38	17 22	17 4	16 53	16 40	16 26	16 8	15 59	15 49	15 38	15 26	15 11
	21	17 53	17 38	17 22	17 3	16 52	16 40	16 25	16 6	15 58	15 48	15 37	15 24	15 9
	22	17 53	17 38	17 22	17 3	16 52	16 39	16 24	16 5	15 56	15 46	15 35	15 22	15 7
	23	17 53	17 38	17 21	17 2	16 51	16 38	16 23	16 4	15 55	15 45	15 34	15 20	15 5
	24	17 53	17 38	17 21	17 2	16 50	16 38	16 22	16 3	15 54	15 44	15 32	15 19	15 3
	25	17 53	17 38	17 21	17 1	16 50	16 37	16 21	16 2	15 53	15 42	15 31	15 17	15 1
	26	17 53	17 38	17 21	17 1	16 50	16 36	16 20	16 1	15 52	15 41	15 29	15 15	14 59
	27	17 53	17 38	17 20	17 1	16 49	16 36	16 20	16 0	15 51	15 40	15 28	15 14	14 57
	28	17 54	17 38	17 20	17 0	16 49	16 35	16 19	15 59	15 50	15 39	15 27	15 12	14 56
	29	17 54	17 38	17 20	17 0	16 48	16 35	16 18	15 58	15 49	15 38	15 25	15 11	14 54
	30	17 54	17 38	17 20	17 0	16 48	16 34	16 18	15 57	15 48	15 37	15 24	15 10	14 52
	31	17 54	17 38	17 20	16 59	16 47	16 34	16 17	15 56	15 47	15 36	15 23	15 8	14 50
June	1	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 56	15 46	15 35	15 22	15 7	14 49
	2	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 55	15 45	15 34	15 21	15 6	14 48
	3	17 54	17 38	17 20	16 59	16 46	16 32	16 16	15 54	15 44	15 33	15 20	15 5	14 46
	4	17 54	17 38	17 20	16 59	16 46	16 32	16 15	15 54	15 44	15 32	15 19	15 4	14 45
	5	17 55	17 38	17 20	16 58	16 46	16 32	16 15	15 53	15 43	15 31	15 18	15 3	14 44
	6	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 53	15 42	15 31	15 17	15 2	14 43
	7	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 42	15 30	15 16	15 1	14 42
	8	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 41	15 30	15 16	15 0	14 41
	9	17 55	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 41	15 29	15 15	14 59	14 40
	10	17 56	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 40	15 28	15 15	14 58	14 39
	11	17 56	17 38	17 20	16 58	16 45	16 30	16 13	15 51	15 40	15 28	15 14	14 58	14 38
	12	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 40	15 28	15 14	14 57	14 37
	13	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 40	15 27	15 13	14 57	14 37
	14	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
	15	17 56	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
	16	17 57	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
	17	17 57	17 40	17 20	16 59	16 45	16 30	16 12	15 50	15 39	15 27	15 12	14 56	14 35
	18	17 57	17 40	17 21	16 59	16 46	16 30	16 13	15 50	15 39	15 27	15 12	14 56	14 35
	19	17 57	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 12	14 56	14 35
	20	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
	21	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
	22	17 58	17 40	17 22	16 59	16 46	16 31	16 13	15 51	15 40	15 27	15 13	14 56	14 36
	23	17 58	17 41	17 22	17 0	16 46	16 31	16 13	15 51	15 40	15 28	15 13	14 56	14 36
	24	17 58	17 41	17 22	17 0	16 47	16 32	16 14	15 51	15 40	15 28	15 14	14 57	14 36
	25	17 59	17 41	17 22	17 0	16 47	16 32	16 14	15 52	15 41	15 28	15 14	14 57	14 37
	26	17 59	17 41	17 22	17 0	16 48	16 32	16 14	15 52	15 41	15 29	15 15	14 58	14 38
	27	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 52	15 42	15 29	15 15	14 58	14 38
	28	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 53	15 42	15 30	15 16	14 59	14 39
	29	18 0	17 42	17 23	17 1	16 48	16 34	16 16	15 53	15 43	15 30	15 16	15 0	14 40
	30	18 0	17 42	17 24	17 2	16 49	16 34	16 16	15 54	15 43	15 31	15 17	15 1	14 41
July	1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
	2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43

TABLE VIII.

717

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May	18	6 0	6 14	6 30	6 48	6 58	7 10	7 24	7 42	7 50	7 59	8 10	8 22	8 36
	19	6 0	6 14	6 30	6 48	6 59	7 11	7 25	7 43	7 52	8 1	8 12	8 24	8 38
	20	6 0	6 15	6 30	6 49	7 0	7 12	7 26	7 44	7 53	8 3	8 14	8 26	8 40
	21	6 0	6 15	6 31	6 49	7 0	7 13	7 28	7 46	7 55	8 4	8 15	8 28	8 43
	22	6 0	6 15	6 31	6 50	7 1	7 14	7 29	7 47	7 56	8 6	8 17	8 30	8 45
	23	6 0	6 15	6 32	6 51	7 2	7 15	7 30	7 48	7 57	8 7	8 19	8 32	8 47
	24	6 0	6 16	6 32	6 51	7 2	7 15	7 31	7 50	7 59	8 9	8 20	8 34	8 49
	25	6 0	6 16	6 32	6 52	7 3	7 16	7 32	7 51	8 0	8 10	8 22	8 36	8 52
	26	6 0	6 16	6 33	6 52	7 4	7 17	7 33	7 52	8 2	8 12	8 24	8 37	8 54
	27	6 0	6 16	6 33	6 53	7 5	7 18	7 34	7 53	8 3	8 13	8 25	8 39	8 56
	28	6 1	6 17	6 34	6 54	7 5	7 19	7 35	7 55	8 4	8 15	8 27	8 41	8 58
	29	6 1	6 17	6 34	6 54	7 6	7 20	7 36	7 56	8 5	8 16	8 28	8 43	9 0
	30	6 1	6 17	6 34	6 55	7 7	7 20	7 36	7 57	8 6	8 17	8 30	8 44	9 2
	31	6 1	6 17	6 35	6 55	7 7	7 21	7 37	7 58	8 8	8 19	8 31	8 46	9 4
June	1	6 1	6 18	6 35	6 56	7 8	7 22	7 38	7 59	8 9	8 20	8 33	8 48	9 5
	2	6 1	6 18	6 36	6 56	7 8	7 22	7 39	8 0	8 10	8 21	8 34	8 49	9 7
	3	6 1	6 18	6 36	6 56	7 9	7 23	7 40	8 1	8 11	8 22	8 35	8 50	9 9
	4	6 2	6 18	6 36	6 57	7 10	7 24	7 41	8 2	8 12	8 24	8 37	8 52	9 10
	5	6 2	6 18	6 37	6 58	7 10	7 24	7 42	8 3	8 13	8 25	8 38	8 53	9 12
	6	6 2	6 19	6 37	6 58	7 11	7 25	7 42	8 4	8 14	8 26	8 39	8 55	9 14
	7	6 2	6 19	6 38	6 59	7 11	7 26	7 43	8 5	8 15	8 27	8 40	8 56	9 15
	8	6 2	6 20	6 38	6 59	7 12	7 26	7 44	8 6	8 16	8 28	8 41	8 57	9 16
	9	6 2	6 20	6 38	7 0	7 12	7 27	7 44	8 6	8 17	8 29	8 42	8 58	9 18
	10	6 3	6 20	6 38	7 0	7 13	7 28	7 45	8 7	8 18	8 30	8 43	8 59	9 19
	11	6 3	6 20	6 39	7 1	7 13	7 28	7 46	8 8	8 18	8 30	8 44	9 1	9 20
	12	6 3	6 20	6 39	7 1	7 14	7 29	7 46	8 8	8 19	8 31	8 45	9 2	9 21
	13	6 3	6 21	6 40	7 1	7 14	7 29	7 47	8 9	8 20	8 32	8 46	9 2	9 22
	14	6 4	6 21	6 40	7 2	7 15	7 30	7 47	8 10	8 20	8 33	8 47	9 3	9 23
	15	6 4	6 21	6 40	7 2	7 15	7 30	7 48	8 10	8 21	8 33	8 47	9 4	9 24
	16	6 4	6 22	6 40	7 2	7 15	7 30	7 48	8 11	8 22	8 34	8 48	9 5	9 25
	17	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 11	8 22	8 34	8 49	9 5	9 26
	18	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 22	8 35	8 49	9 6	9 26
	19	6 5	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 23	8 35	8 50	9 6	9 27
	20	6 5	6 22	6 41	7 4	7 17	7 32	7 50	8 12	8 23	8 36	8 50	9 7	9 27
	21	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 12	8 24	8 36	8 50	9 7	9 28
	22	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
	23	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
	24	6 6	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
	25	6 6	6 24	6 42	7 4	7 18	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
	26	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 7	9 28
	27	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 28
	28	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 27
	29	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 7	9 27
	30	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 24	8 36	8 50	9 6	9 26
July	1	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 23	8 35	8 49	9 6	9 26
	2	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
	3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 23	8 35	8 48	9 5	9 24

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	18 0	17 43	17 24	17 2	16 49	16 34	16 17	15 55	15 44	15 32	15 18	15 2	14 42
	2	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 45	15 33	15 19	15 3	14 43
	3	18 0	17 43	17 25	17 3	16 50	16 36	16 18	15 56	15 45	15 34	15 20	15 4	14 44
	4	18 0	17 43	17 25	17 3	16 51	16 36	16 19	15 57	15 46	15 34	15 21	15 5	14 45
	5	18 1	17 44	17 25	17 4	16 51	16 37	16 19	15 58	15 47	15 35	15 22	15 6	14 46
	6	18 1	17 44	17 26	17 4	16 52	16 37	16 20	15 58	15 48	15 36	15 23	15 7	14 48
	7	18 1	17 44	17 26	17 5	16 52	16 38	16 21	15 59	15 49	15 37	15 24	15 8	14 49
	8	18 1	17 44	17 26	17 5	16 53	16 38	16 21	16 0	15 50	15 38	15 25	15 10	14 51
	9	18 1	17 45	17 27	17 6	16 53	16 39	16 22	16 1	15 51	15 39	15 26	15 11	14 52
	10	18 2	17 45	17 27	17 6	16 54	16 40	16 23	16 2	15 52	15 40	15 27	15 12	14 54
	11	18 2	17 45	17 27	17 7	16 54	16 40	16 24	16 3	15 53	15 42	15 29	15 14	14 56
	12	18 2	17 45	17 28	17 7	16 55	16 41	16 24	16 4	15 54	15 43	15 30	15 15	14 57
	13	18 2	17 46	17 28	17 8	16 56	16 42	16 25	16 5	15 55	15 44	15 32	15 17	14 59
	14	18 2	17 46	17 28	17 8	16 56	16 43	16 26	16 6	15 56	15 45	15 33	15 18	15 1
	15	18 2	17 46	17 29	17 9	16 57	16 43	16 27	16 7	15 58	15 47	15 34	15 20	15 3
	16	18 2	17 46	17 29	17 9	16 58	16 44	16 28	16 8	15 59	15 48	15 36	15 22	15 5
	17	18 2	17 47	17 30	17 10	16 58	16 45	16 29	16 9	16 0	15 49	15 37	15 24	15 7
	18	18 2	17 47	17 30	17 10	16 59	16 46	16 30	16 10	16 1	15 51	15 39	15 25	15 9
	19	18 2	17 47	17 30	17 11	17 0	16 46	16 31	16 12	16 2	15 52	15 41	15 27	15 11
	20	18 3	17 47	17 31	17 12	17 0	16 47	16 32	16 13	16 4	15 54	15 42	15 29	15 13
	21	18 3	17 48	17 31	17 12	17 1	16 48	16 33	16 14	16 5	15 55	15 44	15 31	15 15
	22	18 3	17 48	17 32	17 13	17 2	16 49	16 34	16 15	16 7	15 57	15 45	15 33	15 17
	23	18 3	17 48	17 32	17 13	17 2	16 50	16 35	16 17	16 8	15 58	15 47	15 34	15 20
	24	18 3	17 48	17 32	17 14	17 3	16 51	16 36	16 18	16 9	16 0	15 49	15 36	15 22
	25	18 3	17 48	17 33	17 14	17 4	16 52	16 37	16 19	16 11	16 1	15 51	15 38	15 24
	26	18 3	17 48	17 33	17 15	17 5	16 52	16 38	16 20	16 12	16 3	15 52	15 40	15 26
	27	18 3	17 49	17 33	17 16	17 5	16 53	16 39	16 22	16 14	16 5	15 54	15 42	15 28
	28	18 3	17 49	17 34	17 16	17 6	16 54	16 40	16 23	16 15	16 6	15 56	15 44	15 31
	29	18 3	17 49	17 34	17 17	17 7	16 55	16 42	16 25	16 17	16 8	15 58	15 46	15 33
	30	18 3	17 49	17 34	17 18	17 8	16 56	16 43	16 26	16 18	16 10	16 0	15 48	15 35
Aug.	31	18 3	17 49	17 35	17 18	17 8	16 57	16 44	16 27	16 20	16 11	16 1	15 51	15 38
	1	18 3	17 50	17 35	17 19	17 9	16 58	16 45	16 29	16 21	16 13	16 3	15 53	15 40
	2	18 3	17 50	17 36	17 19	17 10	16 59	16 46	16 30	16 23	16 15	16 5	15 55	15 42
	3	18 3	17 50	17 36	17 20	17 10	17 0	16 47	16 32	16 24	16 16	16 7	15 57	15 45
	4	18 2	17 50	17 36	17 20	17 11	17 1	16 48	16 33	16 26	16 18	16 9	15 59	15 47
	5	18 2	17 50	17 36	17 21	17 12	17 2	16 50	16 34	16 28	16 20	16 11	16 1	15 50
	6	18 2	17 50	17 37	17 22	17 13	17 3	16 51	16 36	16 29	16 21	16 13	16 3	15 52
	7	18 2	17 50	17 37	17 22	17 14	17 4	16 52	16 37	16 31	16 23	16 15	16 5	15 54
	8	18 2	17 50	17 38	17 23	17 14	17 5	16 53	16 39	16 32	16 25	16 17	16 8	15 57
	9	18 2	17 50	17 38	17 24	17 15	17 6	16 54	16 40	16 34	16 27	16 19	16 10	15 59
	10	18 2	17 50	17 38	17 24	17 16	17 6	16 55	16 42	16 36	16 28	16 21	16 12	16 2
	11	18 2	17 51	17 38	17 25	17 17	17 7	16 57	16 43	16 37	16 30	16 23	16 14	16 4
	12	18 2	17 51	17 39	17 25	17 17	17 8	16 58	16 45	16 39	16 32	16 24	16 16	16 6
	13	18 1	17 51	17 39	17 26	17 18	17 9	16 59	16 46	16 40	16 34	16 26	16 18	16 9
	14	18 1	17 51	17 40	17 26	17 19	17 10	17 0	16 48	16 42	16 36	16 28	16 20	16 11
	15	18 1	17 51	17 40	17 27	17 20	17 11	17 1	16 49	16 44	16 37	16 30	16 22	16 14
	16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16

TABLE VIII.

719

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat.	0°		+10°		+20°		+30°		+35°		+40°		+45°		+50°		+52°		+54°		+56°		+58°		+60°	
		h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
July	2	6	7	6	25	6	43	7	5	7	18	7	33	7	50	8	12	8	23	8	35	8	49	9	5	9	25
	3	6	8	6	25	6	43	7	5	7	18	7	32	7	50	8	12	8	23	8	35	8	48	9	5	9	24
	4	6	8	6	25	6	43	7	5	7	18	7	32	7	50	8	12	8	22	8	34	8	48	9	4	9	24
	5	6	8	6	25	6	43	7	5	7	18	7	32	7	50	8	11	8	22	8	34	8	47	9	3	9	23
	6	6	8	6	25	6	43	7	5	7	17	7	32	7	49	8	11	8	21	8	33	8	47	9	2	9	22
	7	6	8	6	25	6	43	7	5	7	17	7	32	7	49	8	10	8	21	8	32	8	46	9	1	9	20
	8	6	8	6	25	6	43	7	4	7	17	7	31	7	48	8	10	8	20	8	32	8	45	9	0	9	19
	9	6	8	6	25	6	43	7	4	7	17	7	31	7	48	8	9	8	19	8	31	8	44	8	59	9	18
	10	6	9	6	25	6	43	7	4	7	16	7	31	7	48	8	9	8	19	8	30	8	43	8	58	9	17
	11	6	9	6	25	6	43	7	4	7	16	7	30	7	47	8	8	8	18	8	29	8	42	8	57	9	16
	12	6	9	6	25	6	43	7	4	7	16	7	30	7	46	8	7	8	17	8	28	8	41	8	56	9	14
	13	6	9	6	25	6	43	7	3	7	16	7	29	7	46	8	6	8	16	8	27	8	40	8	55	9	12
	14	6	9	6	25	6	43	7	3	7	15	7	29	7	45	8	6	8	15	8	26	8	39	8	53	9	11
	15	6	9	6	25	6	43	7	3	7	15	7	28	7	45	8	5	8	14	8	25	8	38	8	52	9	9
	16	6	9	6	25	6	42	7	2	7	14	7	28	7	44	8	4	8	13	8	24	8	36	8	51	9	8
	17	6	9	6	25	6	42	7	2	7	14	7	27	7	43	8	3	8	12	8	23	8	35	8	49	9	6
	18	6	9	6	25	6	42	7	2	7	13	7	27	7	42	8	2	8	11	8	22	8	34	8	47	9	4
	19	6	10	6	25	6	42	7	1	7	13	7	26	7	42	8	1	8	10	8	20	8	32	8	46	9	2
	20	6	10	6	25	6	42	7	1	7	12	7	25	7	41	8	0	8	9	8	19	8	31	8	44	9	0
	21	6	10	6	25	6	41	7	0	7	12	7	25	7	40	7	59	8	8	8	18	8	29	8	42	8	58
	22	6	10	6	25	6	41	7	0	7	11	7	24	7	39	7	58	8	6	8	16	8	28	8	41	8	56
	23	6	10	6	25	6	41	6	59	7	10	7	23	7	38	7	56	8	5	8	15	8	26	8	39	8	54
	24	6	10	6	24	6	40	6	59	7	10	7	22	7	37	7	55	8	4	8	13	8	24	8	37	8	52
	25	6	10	6	24	6	40	6	58	7	9	7	21	7	36	7	54	8	2	8	12	8	23	8	35	8	50
	26	6	10	6	24	6	40	6	58	7	8	7	21	7	35	7	53	8	1	8	10	8	21	8	33	8	48
	27	6	10	6	24	6	39	6	57	7	8	7	20	7	34	7	51	8	0	8	9	8	19	8	31	8	45
	28	6	10	6	24	6	39	6	56	7	7	7	19	7	33	7	50	7	58	8	7	8	18	8	29	8	43
	29	6	10	6	24	6	39	6	56	7	6	7	18	7	32	7	49	7	56	8	5	8	16	8	27	8	40
	30	6	10	6	23	6	38	6	55	7	5	7	17	7	30	7	47	7	55	8	4	8	14	8	25	8	38
	31	6	10	6	23	6	38	6	55	7	4	7	16	7	29	7	46	7	54	8	2	8	12	8	23	8	36
Aug.	1	6	10	6	23	6	37	6	54	7	4	7	15	7	28	7	44	7	52	8	0	8	10	8	21	8	33
	2	6	9	6	23	6	37	6	53	7	3	7	14	7	27	7	43	7	50	7	58	8	8	8	18	8	31
	3	6	9	6	22	6	36	6	52	7	2	7	13	7	26	7	41	7	48	7	57	8	6	8	16	8	28
	4	6	9	6	22	6	36	6	52	7	1	7	12	7	24	7	40	7	47	7	55	8	4	8	14	8	26
	5	6	9	6	22	6	35	6	51	7	0	7	10	7	23	7	38	7	45	7	53	8	2	8	12	8	23
	6	6	9	6	22	6	35	6	50	6	59	7	9	7	21	7	36	7	43	7	51	8	0	8	9	8	21
	7	6	9	6	21	6	34	6	49	6	58	7	8	7	20	7	35	7	41	7	49	7	58	8	7	8	18
	8	6	9	6	21	6	34	6	48	6	57	7	7	7	19	7	33	7	40	7	47	7	55	8	5	8	15
	9	6	9	6	20	6	33	6	48	6	56	7	6	7	17	7	31	7	38	7	45	7	53	8	2	8	13
	10	6	9	6	20	6	32	6	47	6	55	7	5	7	16	7	29	7	36	7	43	7	51	8	0	8	10
	11	6	8	6	20	6	32	6	46	6	54	7	3	7	14	7	28	7	34	7	41	7	49	7	57	8	7
	12	6	8	6	19	6	31	6	45	6	53	7	2	7	13	7	26	7	32	7	39	7	46	7	55	8	5
	13	6	8	6	19	6	30	6	44	6	52	7	1	7	11	7	24	7	30	7	37	7	44	7	52	8	2
	14	6	8	6	18	6	30	6	43	6	51	7	0	7	10	7	22	7	28	7	35	7	42	7	50	7	59
	15	6	8	6	18	6	29	6	42	6	50	6	58	7	8	7	20	7	26	7	32	7	40	7	47	7	56
	16	6	8	6	18	6	28	6	41	6	48	6	57	7	6	7	18	7	24	7	30	7	37	7	45	7	54
	17	6	7	6	17	6	28	6	40	6	47	6	56	7	5	7	17	7	22	7	28	7	35	7	42	7	51

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug.	16	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 51	16 45	16 39	16 32	16 25	16 16
	17	18 1	17 51	17 40	17 28	17 21	17 13	17 4	16 52	16 47	16 41	16 34	16 27	16 18
	18	18 0	17 51	17 41	17 29	17 22	17 14	17 5	16 54	16 48	16 43	16 36	16 29	16 21
	19	18 0	17 51	17 41	17 29	17 23	17 15	17 6	16 55	16 50	16 44	16 38	16 31	16 23
	20	18 0	17 51	17 41	17 30	17 23	17 16	17 7	16 57	16 52	16 46	16 40	16 33	16 26
	21	18 0	17 51	17 42	17 31	17 24	17 17	17 8	16 58	16 53	16 48	16 42	16 36	16 28
	22	17 59	17 51	17 42	17 31	17 25	17 18	17 10	17 0	16 55	16 50	16 44	16 38	16 30
	23	17 59	17 51	17 42	17 32	17 26	17 19	17 11	17 1	16 57	16 52	16 46	16 40	16 33
	24	17 59	17 51	17 42	17 32	17 26	17 20	17 12	17 3	16 58	16 53	16 48	16 42	16 35
	25	17 59	17 51	17 42	17 33	17 27	17 21	17 13	17 4	17 0	16 55	16 50	16 44	16 38
	26	17 58	17 51	17 43	17 33	17 28	17 22	17 14	17 6	17 2	16 57	16 52	16 46	16 40
	27	17 58	17 51	17 43	17 34	17 29	17 23	17 16	17 7	17 3	16 59	16 54	16 48	16 42
	28	17 58	17 51	17 43	17 34	17 29	17 24	17 17	17 8	17 5	17 0	16 56	16 51	16 45
	29	17 58	17 51	17 44	17 35	17 30	17 24	17 18	17 10	17 6	17 2	16 58	16 53	16 47
	30	17 57	17 51	17 44	17 36	17 31	17 25	17 19	17 12	17 8	17 4	17 0	16 55	16 50
Sept.	31	17 57	17 51	17 44	17 36	17 32	17 26	17 20	17 13	17 10	17 6	17 2	16 57	16 52
	1	17 57	17 51	17 44	17 37	17 32	17 27	17 22	17 14	17 11	17 8	17 4	16 59	16 54
	2	17 56	17 51	17 44	17 37	17 33	17 28	17 23	17 16	17 13	17 9	17 6	17 1	16 57
	3	17 56	17 51	17 45	17 38	17 34	17 29	17 24	17 18	17 14	17 11	17 8	17 4	16 59
	4	17 56	17 50	17 45	17 38	17 34	17 30	17 25	17 19	17 16	17 13	17 10	17 6	17 2
	5	17 55	17 50	17 45	17 39	17 35	17 31	17 26	17 20	17 18	17 15	17 12	17 8	17 4
	6	17 55	17 50	17 45	17 40	17 36	17 32	17 28	17 22	17 19	17 17	17 14	17 10	17 6
	7	17 55	17 50	17 46	17 40	17 37	17 33	17 29	17 24	17 21	17 18	17 15	17 12	17 8
	8	17 54	17 50	17 46	17 41	17 38	17 34	17 30	17 25	17 23	17 20	17 17	17 14	17 11
	9	17 54	17 50	17 46	17 41	17 38	17 35	17 31	17 26	17 24	17 22	17 19	17 16	17 13
	10	17 54	17 50	17 46	17 42	17 39	17 36	17 32	17 28	17 26	17 24	17 21	17 19	17 16
	11	17 53	17 50	17 46	17 42	17 40	17 37	17 34	17 29	17 28	17 26	17 23	17 21	17 18
	12	17 53	17 50	17 47	17 43	17 40	17 38	17 35	17 31	17 29	17 27	17 25	17 23	17 20
	13	17 53	17 50	17 47	17 43	17 41	17 39	17 36	17 32	17 31	17 29	17 27	17 25	17 23
	14	17 52	17 50	17 47	17 44	17 42	17 40	17 37	17 34	17 32	17 31	17 29	17 27	17 25
	15	17 52	17 50	17 47	17 44	17 43	17 41	17 38	17 35	17 34	17 33	17 31	17 29	17 27
	16	17 52	17 50	17 48	17 45	17 43	17 42	17 40	17 37	17 36	17 34	17 33	17 31	17 30
	17	17 51	17 50	17 48	17 46	17 44	17 43	17 41	17 38	17 38	17 36	17 35	17 34	17 32
	18	17 51	17 50	17 48	17 46	17 45	17 44	17 42	17 40	17 39	17 38	17 37	17 36	17 34
	19	17 50	17 49	17 48	17 46	17 46	17 44	17 43	17 41	17 41	17 40	17 39	17 38	17 37
	20	17 50	17 49	17 48	17 47	17 46	17 45	17 44	17 43	17 42	17 42	17 41	17 40	17 39
	21	17 50	17 49	17 49	17 48	17 47	17 46	17 46	17 44	17 44	17 43	17 43	17 42	17 41
	22	17 50	17 49	17 49	17 48	17 48	17 47	17 47	17 46	17 46	17 45	17 45	17 44	17 44
	23	17 49	17 49	17 49	17 49	17 48	17 48	17 48	17 47	17 47	17 47	17 47	17 46	17 46
	24	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 48	17 48
	25	17 48	17 49	17 49	17 50	17 50	17 50	17 50	17 50	17 50	17 51	17 51	17 51	17 51
	26	17 48	17 49	17 50	17 50	17 51	17 51	17 52	17 52	17 52	17 52	17 53	17 53	17 53
	27	17 48	17 49	17 50	17 51	17 52	17 52	17 53	17 54	17 54	17 54	17 55	17 55	17 56
	28	17 47	17 49	17 50	17 52	17 52	17 53	17 54	17 55	17 56	17 56	17 57	17 57	17 58
	29	17 47	17 49	17 50	17 52	17 53	17 54	17 55	17 57	17 57	17 58	17 59	17 59	18 0
Oct.	30	17 47	17 49	17 51	17 53	17 54	17 55	17 56	17 58	17 59	18 0	18 1	18 2	18 3
	1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5

TABLE VIII.

721

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 17	6 7	6 17	6 28	6 40	6 47	6 56	7 5	7 17	7 22	7 28	7 35	7 42	7 51
18	6 7	6 17	6 27	6 39	6 46	6 54	7 3	7 15	7 20	7 26	7 32	7 40	7 48
19	6 7	6 16	6 26	6 38	6 45	6 53	7 2	7 13	7 18	7 24	7 30	7 37	7 45
20	6 7	6 16	6 26	6 37	6 44	6 51	7 0	7 11	7 16	7 21	7 28	7 34	7 42
21	6 6	6 15	6 25	6 36	6 42	6 50	6 58	7 9	7 14	7 19	7 25	7 32	7 39
22	6 6	6 15	6 24	6 35	6 41	6 48	6 57	7 7	7 12	7 17	7 23	7 29	7 36
23	6 6	6 14	6 23	6 34	6 40	6 47	6 55	7 5	7 10	7 15	7 20	7 27	7 34
24	6 6	6 14	6 23	6 33	6 39	6 46	6 53	7 3	7 8	7 12	7 18	7 24	7 31
25	6 6	6 13	6 22	6 32	6 38	6 44	6 52	7 1	7 5	7 10	7 15	7 21	7 28
26	6 5	6 13	6 21	6 31	6 36	6 43	6 50	6 59	7 3	7 8	7 13	7 18	7 25
27	6 5	6 12	6 20	6 29	6 35	6 41	6 48	6 57	7 1	7 5	7 10	7 16	7 22
28	6 5	6 12	6 19	6 28	6 34	6 40	6 46	6 55	6 59	7 3	7 8	7 13	7 19
29	6 4	6 11	6 18	6 27	6 32	6 38	6 45	6 53	6 56	7 0	7 5	7 10	7 16
30	6 4	6 10	6 18	6 26	6 31	6 36	6 43	6 51	6 54	6 58	7 2	7 8	7 13
31	6 4	6 10	6 17	6 25	6 30	6 35	6 41	6 48	6 52	6 56	7 0	7 5	7 10
Sept. 1	6 3	6 9	6 16	6 24	6 28	6 33	6 39	6 46	6 50	6 53	6 57	7 2	7 7
2	6 3	6 9	6 15	6 22	6 27	6 32	6 37	6 44	6 48	6 51	6 55	6 59	7 4
3	6 3	6 8	6 14	6 21	6 26	6 30	6 36	6 42	6 45	6 49	6 52	6 56	7 1
4	6 2	6 8	6 13	6 20	6 24	6 28	6 34	6 40	6 43	6 46	6 50	6 54	6 58
5	6 2	6 7	6 13	6 19	6 23	6 27	6 32	6 38	6 41	6 44	6 47	6 51	6 55
6	6 2	6 6	6 12	6 18	6 21	6 25	6 30	6 36	6 38	6 41	6 44	6 48	6 52
7	6 2	6 6	6 11	6 16	6 20	6 24	6 28	6 34	6 36	6 39	6 42	6 45	6 49
8	6 1	6 5	6 10	6 15	6 18	6 22	6 26	6 31	6 34	6 36	6 39	6 42	6 46
9	6 1	6 5	6 9	6 14	6 17	6 20	6 24	6 29	6 31	6 34	6 36	6 40	6 43
10	6 0	6 4	6 8	6 13	6 16	6 19	6 22	6 27	6 29	6 31	6 34	6 37	6 40
11	6 0	6 3	6 7	6 12	6 14	6 17	6 21	6 25	6 27	6 29	6 31	6 34	6 37
12	6 0	6 3	6 6	6 10	6 13	6 16	6 19	6 23	6 24	6 26	6 29	6 31	6 34
13	5 59	6 2	6 5	6 9	6 11	6 14	6 17	6 21	6 22	6 24	6 26	6 28	6 31
14	5 59	6 2	6 4	6 8	6 10	6 12	6 15	6 18	6 20	6 22	6 23	6 26	6 28
15	5 59	6 1	6 4	6 7	6 9	6 11	6 13	6 16	6 18	6 19	6 21	6 23	6 25
16	5 58	6 0	6 3	6 5	6 7	6 9	6 11	6 14	6 15	6 16	6 18	6 20	6 22
17	5 58	6 0	6 2	6 4	6 6	6 7	6 9	6 12	6 13	6 14	6 15	6 17	6 18
18	5 58	5 59	6 1	6 3	6 4	6 6	6 7	6 10	6 10	6 11	6 13	6 14	6 15
19	5 57	5 58	6 0	6 2	6 3	6 4	6 5	6 7	6 8	6 9	6 10	6 11	6 12
20	5 57	5 58	5 59	6 0	6 1	6 2	6 4	6 5	6 6	6 6	6 7	6 8	6 9
21	5 56	5 57	5 58	5 59	6 0	6 1	6 2	6 3	6 3	6 4	6 4	6 6	6 6
22	5 56	5 57	5 57	5 58	5 58	5 59	6 0	6 1	6 1	6 2	6 2	6 3	6 3
23	5 56	5 56	5 56	5 57	5 57	5 57	5 58	5 58	5 59	5 59	5 59	6 0	6 0
24	5 56	5 55	5 55	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 57	5 57
25	5 55	5 55	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54	5 54
26	5 55	5 54	5 54	5 53	5 53	5 52	5 52	5 52	5 52	5 52	5 51	5 51	5 51
27	5 54	5 54	5 53	5 52	5 51	5 51	5 50	5 50	5 49	5 49	5 49	5 48	5 48
28	5 54	5 53	5 52	5 50	5 50	5 49	5 48	5 47	5 47	5 46	5 46	5 46	5 45
29	5 54	5 52	5 51	5 49	5 48	5 48	5 46	5 45	5 45	5 44	5 43	5 43	5 42
30	5 54	5 52	5 50	5 48	5 47	5 46	5 44	5 43	5 42	5 42	5 41	5 40	5 39
Oct. 1	5 53	5 51	5 49	5 47	5 46	5 44	5 43	5 41	5 40	5 39	5 38	5 37	5 36
2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Lat. Date.	0°		+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h	m	h	m	h	m	h	m	h	m	h	m	h	m
Oct.	1	17 46	17 49	17 51	17 53	17 55	17 56	17 58	18 0	18 0	18 2	18 3	18 4	18 5
	2	17 46	17 49	17 51	17 54	17 55	17 57	17 59	18 1	18 2	18 3	18 5	18 6	18 8
	3	17 46	17 49	17 51	17 54	17 56	17 58	18 0	18 3	18 4	18 5	18 7	18 8	18 10
	4	17 46	17 48	17 52	17 55	17 57	17 59	18 1	18 4	18 6	18 7	18 9	18 10	18 12
	5	17 45	17 48	17 52	17 56	17 58	18 0	18 3	18 6	18 7	18 9	18 11	18 12	18 15
	6	17 45	17 48	17 52	17 56	17 58	18 1	18 4	18 7	18 9	18 11	18 13	18 15	18 17
	7	17 45	17 48	17 52	17 57	17 59	18 2	18 5	18 9	18 11	18 13	18 15	18 17	18 19
	8	17 44	17 48	17 53	17 57	18 0	18 3	18 6	18 11	18 12	18 14	18 17	18 19	18 22
	9	17 44	17 48	17 53	17 58	18 1	18 4	18 8	18 12	18 14	18 16	18 19	18 21	18 24
	10	17 44	17 48	17 53	17 58	18 2	18 5	18 9	18 14	18 16	18 18	18 21	18 24	18 27
	11	17 44	17 48	17 54	17 59	18 2	18 6	18 10	18 15	18 18	18 20	18 23	18 26	18 29
	12	17 43	17 48	17 54	18 0	18 3	18 7	18 12	18 17	18 19	18 22	18 25	18 28	18 32
	13	17 43	17 48	17 54	18 0	18 4	18 8	18 13	18 18	18 21	18 24	18 27	18 30	18 34
	14	17 43	17 48	17 54	18 1	18 5	18 9	18 14	18 20	18 23	18 26	18 29	18 32	18 36
	15	17 43	17 49	17 55	18 2	18 6	18 10	18 16	18 22	18 24	18 28	18 31	18 35	18 39
	16	17 42	17 49	17 55	18 2	18 7	18 11	18 17	18 23	18 26	18 29	18 33	18 37	18 41
	17	17 42	17 49	17 56	18 3	18 8	18 12	18 18	18 25	18 28	18 31	18 35	18 39	18 44
	18	17 42	17 49	17 56	18 4	18 8	18 13	18 19	18 26	18 30	18 33	18 37	18 42	18 46
	19	17 42	17 49	17 56	18 4	18 9	18 14	18 21	18 28	18 31	18 35	18 39	18 44	18 49
	20	17 42	17 49	17 57	18 5	18 10	18 16	18 22	18 30	18 33	18 37	18 41	18 46	18 51
	21	17 41	17 49	17 57	18 6	18 11	18 17	18 23	18 31	18 35	18 39	18 43	18 48	18 54
	22	17 41	17 49	17 57	18 6	18 12	18 18	18 25	18 33	18 37	18 41	18 45	18 51	18 56
	23	17 41	17 49	17 58	18 7	18 13	18 19	18 26	18 35	18 38	18 43	18 48	18 53	18 59
	24	17 41	17 49	17 58	18 8	18 14	18 20	18 28	18 36	18 40	18 45	18 50	18 55	19 2
	25	17 41	17 50	17 59	18 9	18 14	18 21	18 29	18 38	18 42	18 47	18 52	18 58	19 4
	26	17 41	17 50	17 59	18 10	18 15	18 22	18 30	18 40	18 44	18 49	18 54	19 0	19 6
	27	17 41	17 50	17 59	18 10	18 16	18 23	18 32	18 41	18 46	18 51	18 56	19 2	19 9
	28	17 40	17 50	18 0	18 11	18 17	18 24	18 33	18 43	18 47	18 53	18 58	19 4	19 12
	29	17 40	17 50	18 0	18 12	18 18	18 26	18 34	18 44	18 49	18 55	19 0	19 7	19 14
	30	17 40	17 50	18 1	18 12	18 19	18 27	18 36	18 46	18 51	18 56	19 2	19 9	19 17
Nov.	31	17 40	17 50	18 1	18 13	18 20	18 28	18 37	18 48	18 53	18 58	19 5	19 12	19 19
	1	17 40	17 51	18 2	18 14	18 21	18 29	18 38	18 50	18 55	19 0	19 7	19 14	19 22
	2	17 40	17 51	18 2	18 15	18 22	18 30	18 40	18 51	18 56	19 2	19 9	19 16	19 24
	3	17 40	17 51	18 2	18 16	18 23	18 31	18 41	18 53	18 58	19 4	19 11	19 18	19 27
	4	17 40	17 51	18 3	18 16	18 24	18 32	18 42	18 54	19 0	19 6	19 13	19 21	19 30
	5	17 40	17 52	18 4	18 17	18 25	18 34	18 44	18 56	19 2	19 8	19 15	19 23	19 32
	6	17 40	17 52	18 4	18 18	18 26	18 35	18 45	18 58	19 4	19 10	19 17	19 26	19 35
	7	17 40	17 52	18 4	18 19	18 27	18 36	18 47	19 0	19 6	19 12	19 20	19 28	19 37
	8	17 40	17 52	18 5	18 19	18 28	18 37	18 48	19 1	19 7	19 14	19 22	19 30	19 40
	9	17 40	17 53	18 6	18 20	18 29	18 38	18 49	19 3	19 9	19 16	19 24	19 32	19 42
	10	17 41	17 53	18 6	18 21	18 30	18 39	18 51	19 4	19 11	19 18	19 26	19 35	19 45
	11	17 41	17 53	18 6	18 22	18 31	18 40	18 52	19 6	19 13	19 20	19 28	19 37	19 48
	12	17 41	17 54	18 7	18 23	18 32	18 42	18 53	19 8	19 14	19 22	19 30	19 39	19 50
	13	17 41	17 54	18 8	18 24	18 33	18 43	18 55	19 9	19 16	19 24	19 32	19 42	19 53
	14	17 41	17 54	18 8	18 24	18 34	18 44	18 56	19 11	19 18	19 26	19 34	19 44	19 55
	15	17 41	17 55	18 9	18 25	18 34	18 45	18 58	19 13	19 20	19 28	19 36	19 46	19 58
	16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0

TABLE VIII.

723

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct.	2	5 53	5 50	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 34	5 33
	3	5 52	5 50	5 47	5 44	5 43	5 41	5 39	5 36	5 35	5 34	5 33	5 32	5 30
	4	5 52	5 49	5 46	5 43	5 42	5 39	5 37	5 34	5 33	5 32	5 30	5 29	5 27
	5	5 52	5 49	5 46	5 42	5 40	5 38	5 35	5 32	5 31	5 29	5 28	5 26	5 24
	6	5 52	5 48	5 45	5 41	5 39	5 36	5 33	5 30	5 28	5 27	5 25	5 23	5 21
	7	5 51	5 48	5 44	5 40	5 37	5 35	5 32	5 28	5 26	5 24	5 22	5 20	5 18
	8	5 51	5 47	5 43	5 38	5 36	5 33	5 30	5 26	5 24	5 22	5 20	5 18	5 15
	9	5 51	5 46	5 42	5 37	5 34	5 31	5 28	5 24	5 22	5 20	5 17	5 15	5 12
	10	5 50	5 46	5 41	5 36	5 33	5 30	5 26	5 22	5 20	5 17	5 15	5 12	5 9
	11	5 50	5 45	5 40	5 35	5 32	5 28	5 24	5 19	5 17	5 15	5 12	5 9	5 6
	12	5 50	5 45	5 40	5 34	5 30	5 27	5 22	5 17	5 15	5 12	5 10	5 6	5 3
	13	5 50	5 44	5 39	5 33	5 29	5 25	5 21	5 15	5 13	5 10	5 7	5 4	5 0
	14	5 50	5 44	5 38	5 32	5 28	5 24	5 19	5 13	5 11	5 8	5 5	5 1	4 57
	15	5 49	5 43	5 37	5 30	5 27	5 22	5 17	5 11	5 8	5 5	5 2	4 58	4 54
	16	5 49	5 43	5 37	5 29	5 25	5 21	5 15	5 9	5 6	5 3	5 0	4 56	4 51
	17	5 49	5 42	5 36	5 28	5 24	5 19	5 14	5 7	5 4	5 1	4 57	4 53	4 48
	18	5 49	5 42	5 35	5 27	5 23	5 18	5 12	5 5	5 2	4 58	4 55	4 50	4 46
	19	5 48	5 42	5 34	5 26	5 22	5 16	5 10	5 3	5 0	4 56	4 52	4 48	4 43
	20	5 48	5 41	5 34	5 25	5 20	5 15	5 8	5 1	4 58	4 54	4 50	4 45	4 40
	21	5 48	5 41	5 33	5 24	5 19	5 13	5 7	4 59	4 56	4 52	4 47	4 42	4 37
	22	5 48	5 40	5 32	5 23	5 18	5 12	5 5	4 57	4 53	4 49	4 45	4 40	4 34
	23	5 48	5 40	5 32	5 22	5 17	5 11	5 4	4 55	4 51	4 47	4 42	4 37	4 31
	24	5 48	5 39	5 31	5 21	5 16	5 9	5 2	4 53	4 49	4 45	4 40	4 35	4 28
	25	5 48	5 39	5 30	5 20	5 14	5 8	5 0	4 51	4 47	4 43	4 38	4 32	4 26
	26	5 47	5 39	5 30	5 19	5 13	5 7	4 59	4 50	4 45	4 40	4 35	4 30	4 23
	27	5 47	5 38	5 29	5 18	5 12	5 5	4 57	4 48	4 43	4 38	4 33	4 27	4 20
	28	5 47	5 38	5 28	5 17	5 11	5 4	4 56	4 46	4 41	4 36	4 31	4 24	4 18
	29	5 47	5 38	5 28	5 16	5 10	5 3	4 54	4 44	4 39	4 34	4 28	4 22	4 15
	30	5 47	5 37	5 27	5 16	5 9	5 2	4 53	4 42	4 38	4 32	4 26	4 20	4 12
	31	5 47	5 37	5 27	5 15	5 8	5 0	4 51	4 40	4 36	4 30	4 24	4 17	4 10
Nov.	1	5 47	5 37	5 26	5 14	5 7	4 59	4 50	4 39	4 34	4 28	4 22	4 15	4 7
	2	5 47	5 37	5 26	5 13	5 6	4 58	4 48	4 37	4 32	4 26	4 20	4 12	4 4
	3	5 47	5 36	5 25	5 12	5 5	4 57	4 47	4 35	4 30	4 24	4 18	4 10	4 2
	4	5 47	5 36	5 25	5 12	5 4	4 56	4 46	4 34	4 28	4 22	4 15	4 8	3 59
	5	5 47	5 36	5 24	5 11	5 3	4 54	4 44	4 32	4 26	4 20	4 13	4 5	3 56
	6	5 47	5 36	5 24	5 10	5 2	4 53	4 43	4 30	4 25	4 18	4 11	4 3	3 54
	7	5 47	5 36	5 23	5 9	5 1	4 52	4 42	4 29	4 23	4 16	4 9	4 1	3 52
	8	5 47	5 35	5 23	5 9	5 0	4 51	4 40	4 27	4 21	4 15	4 7	3 59	3 49
	9	5 47	5 35	5 22	5 8	5 0	4 50	4 39	4 26	4 20	4 13	4 5	3 56	3 47
	10	5 48	5 35	5 22	5 7	4 59	4 49	4 38	4 24	4 18	4 11	4 3	3 54	3 44
	11	5 48	5 35	5 22	5 7	4 58	4 48	4 37	4 23	4 16	4 9	4 1	3 52	3 42
	12	5 48	5 35	5 21	5 6	4 57	4 47	4 36	4 21	4 15	4 8	3 59	3 50	3 40
	13	5 48	5 35	5 21	5 6	4 57	4 46	4 34	4 20	4 13	4 6	3 58	3 48	3 37
	14	5 48	5 35	5 21	5 5	4 56	4 46	4 33	4 19	4 12	4 4	3 56	3 46	3 35
	15	5 48	5 35	5 20	5 4	4 55	4 45	4 32	4 17	4 10	4 3	3 54	3 44	3 33
	16	5 48	5 35	5 20	5 4	4 55	4 44	4 31	4 16	4 9	4 1	3 52	3 42	3 31
	17	5 48	5 35	5 20	5 4	4 54	4 43	4 30	4 15	4 8	4 0	3 51	3 40	3 28

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 726.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov.	16	17 41	17 55	18 10	18 26	18 35	18 46	18 59	19 14	19 22	19 29	19 38	19 48	20 0
	17	17 42	17 56	18 10	18 27	18 36	18 47	19 0	19 16	19 23	19 31	19 40	19 51	20 3
	18	17 42	17 56	18 11	18 28	18 37	18 48	19 2	19 18	19 25	19 33	19 42	19 53	20 5
	19	17 42	17 56	18 11	18 28	18 38	18 50	19 3	19 19	19 27	19 35	19 44	19 55	20 8
	20	17 42	17 57	18 12	18 29	18 39	18 51	19 4	19 21	19 28	19 37	19 46	19 57	20 10
	21	17 42	17 57	18 13	18 30	18 40	18 52	19 6	19 22	19 30	19 39	19 48	20 0	20 12
	22	17 43	17 58	18 13	18 31	18 41	18 53	19 7	19 24	19 32	19 40	19 50	20 2	20 15
	23	17 43	17 58	18 14	18 32	18 42	18 54	19 8	19 25	19 33	19 42	19 52	20 4	20 17
	24	17 43	17 58	18 14	18 33	18 43	18 55	19 9	19 27	19 35	19 44	19 54	20 6	20 20
	25	17 44	17 59	18 15	18 34	18 44	18 56	19 11	19 28	19 37	19 46	19 56	20 8	20 22
	26	17 44	17 59	18 16	18 34	18 45	18 57	19 12	19 30	19 38	19 47	19 58	20 10	20 24
	27	17 44	18 0	18 16	18 35	18 46	18 58	19 13	19 31	19 40	19 49	20 0	20 12	20 26
	28	17 44	18 0	18 17	18 36	18 47	19 0	19 14	19 33	19 41	19 51	20 2	20 14	20 29
	29	17 45	18 1	18 18	18 37	18 48	19 1	19 16	19 34	19 43	19 52	20 3	20 16	20 31
	30	17 45	18 1	18 18	18 38	18 49	19 2	19 17	19 35	19 44	19 54	20 5	20 18	20 33
Dec.	1	17 46	18 2	18 19	18 38	18 50	19 3	19 18	19 37	19 46	19 56	20 7	20 20	20 35
	2	17 46	18 2	18 20	18 39	18 51	19 4	19 19	19 38	19 47	19 57	20 8	20 22	20 37
	3	17 46	18 3	18 20	18 40	18 51	19 5	19 20	19 39	19 48	19 58	20 10	20 23	20 39
	4	17 47	18 3	18 21	18 41	18 52	19 6	19 21	19 41	19 50	20 0	20 12	20 25	20 41
	5	17 47	18 4	18 21	18 42	18 53	19 7	19 22	19 42	19 51	20 1	20 13	20 27	20 43
	6	17 48	18 4	18 22	18 42	18 54	19 8	19 24	19 43	19 52	20 3	20 14	20 28	20 44
	7	17 48	18 5	18 23	18 43	18 55	19 8	19 25	19 44	19 54	20 4	20 16	20 30	20 46
	8	17 48	18 5	18 23	18 44	18 56	19 9	19 26	19 45	19 55	20 5	20 17	20 31	20 48
	9	17 49	18 6	18 24	18 44	18 56	19 10	19 27	19 46	19 56	20 7	20 19	20 33	20 49
	10	17 49	18 6	18 24	18 45	18 57	19 11	19 27	19 47	19 57	20 8	20 20	20 34	20 51
	11	17 50	18 7	18 25	18 46	18 58	19 12	19 28	19 48	19 58	20 9	20 21	20 35	20 52
	12	17 50	18 7	18 26	18 46	18 59	19 13	19 29	19 49	19 59	20 10	20 22	20 37	20 54
	13	17 51	18 8	18 26	18 47	18 59	19 13	19 30	19 50	20 0	20 11	20 23	20 38	20 55
	14	17 51	18 8	18 27	18 48	19 0	19 14	19 31	19 51	20 1	20 12	20 24	20 39	20 56
	15	17 52	18 9	18 27	18 48	19 1	19 15	19 32	19 52	20 2	20 13	20 25	20 40	20 57
	16	17 52	18 10	18 28	18 49	19 1	19 16	19 32	19 53	20 3	20 14	20 26	20 41	20 58
	17	17 53	18 10	18 28	18 50	19 2	19 16	19 33	19 54	20 4	20 14	20 27	20 42	20 59
	18	17 53	18 10	18 29	18 50	19 3	19 17	19 34	19 54	20 4	20 15	20 28	20 43	21 0
	19	17 54	18 11	18 30	18 51	19 3	19 17	19 34	19 55	20 5	20 16	20 29	20 44	21 1
	20	17 54	18 12	18 30	18 51	19 4	19 18	19 35	19 56	20 6	20 17	20 29	20 44	21 2
	21	17 55	18 12	18 31	18 52	19 4	19 18	19 35	19 56	20 6	20 17	20 30	20 45	21 2
	22	17 55	18 12	18 31	18 52	19 5	19 19	19 36	19 57	20 7	20 18	20 30	20 45	21 3
	23	17 56	18 13	18 32	18 53	19 5	19 19	19 36	19 57	20 7	20 18	20 31	20 46	21 3
	24	17 56	18 13	18 32	18 53	19 6	19 20	19 37	19 57	20 7	20 18	20 31	20 46	21 4
	25	17 57	18 14	18 32	18 54	19 6	19 20	19 37	19 58	20 8	20 19	20 32	20 46	21 4
	26	17 57	18 15	18 33	18 54	19 6	19 21	19 37	19 58	20 8	20 19	20 32	20 46	21 4
	27	17 58	18 15	18 33	18 55	19 7	19 21	19 38	19 59	20 8	20 19	20 32	20 47	21 4
	28	17 58	18 15	18 34	18 55	19 7	19 21	19 38	19 59	20 8	20 20	20 32	20 47	21 4
	29	17 58	18 16	18 34	18 55	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 47	21 4
	30	17 59	18 16	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 46	21 4
	31	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 20	20 32	20 46	21 3

TABLE VIII.

725

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 726.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Nov. 17	h m 5 48	h m 5 35	h m 5 20	h m 5 4	h m 4 54	h m 4 43	h m 4 30	h m 4 15	h m 4 8	h m 4 0	h m 3 51	h m 3 40	h m 3 28
18	5 49	5 35	5 20	5 3	4 53	4 42	4 29	4 14	4 6	3 58	3 49	3 38	3 26
19	5 49	5 35	5 20	5 3	4 53	4 42	4 28	4 12	4 5	3 57	3 47	3 37	3 24
20	5 49	5 35	5 20	5 2	4 52	4 41	4 28	4 11	4 4	3 55	3 46	3 35	3 22
21	5 49	5 35	5 20	5 2	4 52	4 40	4 27	4 10	4 2	3 54	3 44	3 33	3 20
22	5 50	5 35	5 19	5 2	4 51	4 40	4 26	4 9	4 1	3 53	3 43	3 32	3 19
23	5 50	5 35	5 19	5 1	4 51	4 39	4 25	4 8	4 0	3 51	3 41	3 30	3 17
24	5 50	5 35	5 19	5 1	4 50	4 39	4 24	4 7	3 59	3 50	3 40	3 28	3 15
25	5 51	5 35	5 19	5 1	4 50	4 38	4 24	4 6	3 58	3 49	3 39	3 27	3 13
26	5 51	5 35	5 19	5 1	4 50	4 38	4 23	4 6	3 57	3 48	3 38	3 26	3 12
27	5 51	5 36	5 19	5 0	4 50	4 37	4 22	4 5	3 56	3 47	3 36	3 24	3 10
28	5 51	5 36	5 19	5 0	4 49	4 37	4 22	4 4	3 55	3 46	3 35	3 23	3 8
29	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 3	3 54	3 45	3 34	3 22	3 7
30	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 2	3 54	3 44	3 33	3 20	3 5
Dec. 1	5 52	5 36	5 19	5 0	4 49	4 36	4 20	4 2	3 53	3 43	3 32	3 19	3 4
2	5 53	5 37	5 20	5 0	4 48	4 36	4 20	4 1	3 52	3 42	3 31	3 18	3 3
3	5 53	5 37	5 20	5 0	4 48	4 35	4 20	4 1	3 52	3 42	3 30	3 17	3 2
4	5 54	5 37	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 41	3 30	3 16	3 0
5	5 54	5 38	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 40	3 29	3 15	2 59
6	5 54	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 40	3 28	3 14	2 58
7	5 55	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 39	3 27	3 14	2 57
8	5 55	5 38	5 21	5 0	4 48	4 35	4 18	3 59	3 49	3 39	3 27	3 13	2 57
9	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 56
10	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 55
11	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 49	3 38	3 26	3 11	2 55
12	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
13	5 58	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 48	3 38	3 25	3 11	2 54
14	5 58	5 41	5 22	5 2	4 49	4 35	4 19	3 58	3 48	3 38	3 25	3 11	2 54
15	5 58	5 41	5 23	5 2	4 50	4 36	4 19	3 58	3 48	3 38	3 25	3 10	2 53
16	5 59	5 42	5 23	5 2	4 50	4 36	4 19	3 58	3 49	3 38	3 25	3 10	2 53
17	6 0	5 42	5 24	5 2	4 50	4 36	4 19	3 59	3 49	3 38	3 25	3 10	2 53
18	6 0	5 42	5 24	5 3	4 50	4 36	4 20	3 59	3 49	3 38	3 25	3 10	2 53
19	6 0	5 43	5 25	5 3	4 51	4 37	4 20	3 59	3 49	3 38	3 25	3 11	2 53
20	6 1	5 44	5 25	5 4	4 51	4 37	4 20	4 0	3 50	3 38	3 26	3 11	2 53
21	6 2	5 44	5 26	5 4	4 52	4 38	4 21	4 0	3 50	3 39	3 26	3 11	2 54
22	6 2	5 44	5 26	5 5	4 52	4 38	4 21	4 0	3 50	3 39	3 27	3 12	2 54
23	6 2	5 45	5 26	5 5	4 53	4 39	4 22	4 1	3 51	3 40	3 27	3 12	2 55
24	6 3	5 46	5 27	5 6	4 53	4 39	4 22	4 2	3 52	3 40	3 28	3 13	2 55
25	6 3	5 46	5 28	5 6	4 54	4 40	4 23	4 2	3 52	3 41	3 28	3 14	2 56
26	6 4	5 47	5 28	5 7	4 54	4 40	4 24	4 3	3 53	3 42	3 29	3 14	2 57
27	6 4	5 47	5 29	5 7	4 55	4 41	4 24	4 4	3 54	3 43	3 30	3 15	2 58
28	6 5	5 48	5 29	5 8	4 56	4 42	4 25	4 4	3 54	3 43	3 31	3 16	2 59
29	6 6	5 48	5 30	5 9	4 56	4 42	4 26	4 5	3 55	3 44	3 32	3 17	3 0
30	6 6	5 49	5 30	5 9	4 57	4 43	4 26	4 6	3 56	3 45	3 33	3 18	3 1
31	6 6	5 49	5 31	5 10	4 58	4 44	4 27	4 7	3 57	3 46	3 34	3 19	3 2
32	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 47	3 35	3 21	3 4

TABLE IX.

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1923.

In the case of a southern latitude the time of sunrise or sunset is taken from Table VIII, with the corresponding northern latitude, not for the given date but for a date about six months earlier or later, which is to be found in the following table. The time taken from Table VIII, whether of sunrise or of sunset, must be corrected by the quantity given in Table IX on the same line with the given date.

Example.—May 10, 1923, civil date, in latitude -38° , required the time of sunrise and sunset. The astronomical date is May 9 for sunrise and May 10 for sunset; Table IX gives November 11 and 12 as the corresponding dates, northern latitude, while the correction is $+12^m$ in each case.

					Sunrise. d h m				Sunset. d h m
Table VIII, Lat. $+38^{\circ}$	.	.	.	Nov.	11 18 36			Nov.	12 4 51
Table IX	.	.	.	May	9 + 12			May	10 + 12
Local astronomical mean time	.	.	.	May	9 18 48			May	10 5 3
Civil time	.	.	.	May	10 6 48 A. M.			May	10 5 3 P. M.

Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.
Jan. 0	July 2	-1^m	Feb. 5	Aug. 9	$+9^m$	Mar. 13	Sept. 15	$+14^m$	Apr. 18	Oct. 21	$+15^m$
1	3	0	6	10	9	14	16	14	19	22	15
2	4	0	7	11	9	15	17	14	20	23	14
3	5	0	8	12	9	16	18	15	21	24	14
4	6	0	9	13	10	17	19	15	22	25	14
5	7	$+1$	10	14	$+10$	18	20	$+15$	23	26	$+14$
6	8	1	11	15	10	19	21	15	24	27	14
7	9	1	12	16	10	20	22	15	25	28	14
8	10	2	13	17	10	21	23	15	26	29	14
9	11	2	14	18	11	22	24	15	27	30	14
10	12	$+2$	15	19	$+11$	23	25	$+15$	28	31	$+14$
11	13	2	16	20	11	24	26	15	29	Nov. 1	14
12	14	3	17	21	11	25	27	15	30	2	14
13	15	3	18	23	11	26	28	15	May 1	3	13
14	16	3	19	24	12	27	29	15	2	4	13
15	18	$+4$	20	25	$+12$	28	30	$+15$	3	5	$+13$
16	19	4	21	26	12	29	Oct. 2	15	4	6	13
17	20	4	22	27	12	30	3	16	5	7	13
18	21	4	23	28	12	31	4	16	6	8	13
19	22	5	24	29	12	Apr. 1	5	16	7	9	13
20	23	$+5$	25	30	$+13$	2	6	$+16$	8	10	$+12$
21	24	5	26	31	13	3	7	16	9	11	12
22	25	5	27	Sept. 1	13	4	8	15	10	12	12
23	26	6	28	2	13	5	9	15	11	13	12
24	27	6	Mar. 1	3	13	6	10	15	12	14	12
25	28	$+6$	2	4	$+13$	7	10	$+15$	13	15	$+12$
26	29	6	3	5	13	8	11	15	14	16	11
27	30	7	4	6	13	9	12	15	15	16	11
28	31	7	5	7	14	10	13	15	16	17	11
29	Aug. 1	7	6	8	14	11	14	15	17	18	11
30	2	$+7$	7	9	$+14$	12	15	$+15$	18	19	$+11$
31	4	8	8	10	14	13	16	15	19	20	11
Feb. 1	5	8	9	11	14	14	17	15	20	21	10
2	6	8	10	12	14	15	18	15	21	22	10
3	7	8	11	13	14	16	19	15	22	23	10
4	8	$+9$	12	14	$+14$	17	20	$+15$	23	24	$+10$

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1923.

Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.	Given Date.	Corresponding Date, Northern Latitude.	Correc-tion.
	m			m			m			m	
May 24	Nov. 25	+10	July 19	Jan. 16	- 4	Sept. 13	Mar. 11	-14	Nov. 8	May 6	-13
25	26	9	20	17	4	14	12	14	9	7	13
26	27	9	21	18	4	15	13	14	10	8	12
27	28	9	22	19	5	16	14	14	11	9	12
28	29	9	23	20	5	17	15	14	12	10	12
29	30	+ 8	24	21	- 5	18	16	-15	13	11	-12
30	Dec. 1	8	25	22	5	19	17	15	14	12	12
31	2	8	26	23	6	20	18	15	15	13	12
June 1	3	8	27	24	6	21	19	15	16	15	11
2	4	8	28	25	6	22	20	15	17	16	11
3	5	+ 7	29	26	- 6	23	21	-15	18	17	-11
4	5	7	30	27	7	24	22	15	19	18	11
5	6	7	31	28	7	25	23	15	20	19	11
6	7	7	Aug. 1	29	7	26	24	15	21	20	10
7	8	7	2	30	7	27	25	15	22	21	10
8	9	+ 6	3	30	- 7	28	26	-15	23	22	-10
9	10	6	4	31	8	29	27	15	24	23	10
10	11	6	5	Feb. 1	8	30	28	15	25	24	10
11	12	6	6	2	8	Oct. 1	29	15	26	25	9
12	13	5	7	3	8	2	29	15	27	26	9
13	14	+ 5	8	4	- 9	3	30	-16	28	27	- 9
14	15	5	9	5	9	4	31	16	29	28	9
15	16	4	10	6	9	5	Apr. 1	16	30	29	8
16	17	4	11	7	9	6	2	16	Dec. 1	30	8
17	18	4	12	8	9	7	3	16	2	31	8
18	19	+ 4	13	9	-10	8	4	-15	3	June 1	- 8
19	20	4	14	10	10	9	5	15	4	2	8
20	20	4	15	11	10	10	7	15	5	4	7
21	21	3	16	12	10	11	8	15	6	5	7
22	22	3	17	13	10	12	9	15	7	6	7
23	23	+ 3	18	14	-11	13	10	-15	8	7	- 7
24	24	2	19	15	11	14	11	15	9	8	6
25	25	2	20	16	11	15	12	15	10	9	6
26	26	2	21	17	11	16	13	15	11	10	6
27	27	2	22	18	11	17	14	15	12	11	6
28	28	+ 1	23	18	-11	18	15	-15	13	12	- 5
29	29	1	24	19	12	19	16	15	14	13	5
30	30	1	25	20	12	20	17	15	15	14	5
July 1	Dec. 31	1	26	21	12	21	18	15	16	15	4
2	Jan. 0	+ 1	27	22	12	22	19	15	17	16	4
3	1	0	28	23	-12	23	20	-14	18	17	- 4
4	2	0	29	24	12	24	21	14	19	18	4
5	3	0	30	25	13	25	22	14	20	19	4
6	4	0	31	26	13	26	23	14	21	21	3
7	5	- 1	Sept. 1	27	13	27	24	14	22	22	3
8	6	- 1	2	28	-13	28	25	-14	23	23	- 3
9	7	1	3	Mar. 1	13	29	26	14	24	24	2
10	8	2	4	2	13	30	27	14	25	25	2
11	9	2	5	3	13	31	28	14	26	26	2
12	10	2	6	4	13	Nov. 1	29	14	27	27	2
13	11	- 2	7	5	-14	2	30	-14	28	28	- 1
14	12	3	8	6	14	3	May 1	13	29	29	1
15	13	3	9	7	14	4	2	13	30	30	1
16	14	3	10	8	14	5	3	13	31	July 1	- 1
17	15	4	11	9	14	6	4	13	32	2	0
18	15	- 4	12	10	-14	7	5	-13			

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Data.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan.													
1	4 50	4 36	4 21	4 4	3 54	3 43	3 30	3 14	3 7	2 58	2 49	2 39	2 27
2	5 43	5 30	5 15	4 58	4 48	4 36	4 23	4 7	3 59	3 51	3 41	3 30	3 18
3	6 38	6 25	6 11	5 55	5 46	5 35	5 22	5 7	5 0	4 52	4 43	4 33	4 21
4	7 34	7 22	7 10	6 56	6 47	6 38	6 27	6 14	6 8	6 1	5 53	5 45	5 35
5	8 28	8 19	8 9	7 58	7 52	7 44	7 36	7 25	7 20	7 15	7 9	7 3	6 55
6	9 21	9 15	9 8	9 1	8 57	8 52	8 46	8 39	8 36	8 32	8 29	8 24	8 20
7	10 14	10 11	10 8	10 4	10 2	10 0	9 57	9 54	9 52	9 50	9 49	9 47	9 44
8	11 6	11 6	11 6	11 7	11 7	11 8	11 8	11 8	11 9	11 9	11 9	11 10	11 10
9	11 57	12 1	12 5	12 10	12 12	12 15	12 19	12 23	12 25	12 27	12 30	12 33	12 36
10	12 49	12 56	13 4	13 12	13 17	13 23	13 30	13 37	13 41	13 45	13 50	13 55	14 0
11	13 43	13 52	14 3	14 15	14 22	14 30	14 39	14 50	14 56	15 1	15 8	15 15	15 23
12	14 37	14 49	15 2	15 16	15 25	15 35	15 46	16 0	16 7	16 14	16 22	16 32	16 42
13	15 32	15 46	16 0	16 16	16 26	16 37	16 50	17 6	17 13	17 22	17 31	17 41	17 54
14	16 27	16 41	16 56	17 13	17 24	17 35	17 48	18 5	18 13	18 21	18 31	18 42	18 55
15	17 22	17 35	17 50	18 6	18 16	18 27	18 40	18 56	19 4	19 12	19 21	19 32	19 44
16	18 14	18 27	18 40	18 55	19 4	19 14	19 26	19 40	19 47	19 54	20 2	20 12	20 22
17	19 5	19 15	19 27	19 40	19 47	19 55	20 5	20 17	20 22	20 28	20 35	20 43	20 51
18	19 53	20 1	20 10	20 20	20 26	20 32	20 40	20 49	20 53	20 58	21 3	21 8	21 15
19	20 38	20 44	20 50	20 57	21 1	21 5	21 10	21 17	21 20	21 22	21 26	21 30	21 34
20	21 22	21 25	21 28	21 32	21 34	21 36	21 39	21 42	21 43	21 45	21 47	21 49	21 51
21	22 5	22 5	22 5	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6	22 6
22	22 47	22 45	22 42	22 39	22 37	22 35	22 32	22 30	22 28	22 27	22 26	22 24	22 22
23	23 30	23 25	23 19	23 12	23 9	23 5	23 0	22 54	22 52	22 49	22 46	22 42	22 38
24	....	....	23 58	23 48	23 43	23 36	23 29	23 21	23 17	23 12	23 8	23 2	22 57
25	0 14	0 6	....	....	....	....	....	23 51	23 45	23 40	23 33	23 26	23 18
26	0 59	0 49	0 38	0 26	0 19	0 11	0 2	....	....	....	....	23 55	23 45
27	1 47	1 35	1 22	1 7	0 59	0 49	0 38	0 25	0 18	0 12	0 4	....	....
28	2 37	2 24	2 9	1 53	1 44	1 33	1 20	1 5	0 58	0 50	0 41	0 32	0 20
29	3 30	3 16	3 1	2 44	2 34	2 23	2 9	1 54	1 46	1 38	1 28	1 17	1 5
30	4 24	4 10	3 56	3 39	3 30	3 18	3 5	2 50	2 42	2 34	2 25	2 14	2 2
Feb.													
31	5 20	5 7	4 54	4 39	4 30	4 20	4 8	3 54	3 47	3 40	3 32	3 22	3 11
1	6 16	6 5	5 54	5 42	5 34	5 26	5 16	5 5	4 59	4 53	4 46	4 39	4 30
2	7 11	7 4	6 56	6 46	6 41	6 35	6 28	6 20	6 16	6 11	6 6	6 1	5 55
3	8 6	8 2	7 57	7 52	7 49	7 45	7 41	7 37	7 34	7 32	7 29	7 26	7 23
4	9 0	8 59	8 58	8 57	8 56	8 56	8 55	8 54	8 54	8 53	8 53	8 52	8 51
5	9 53	9 56	9 58	10 2	10 3	10 5	10 8	10 11	10 12	10 14	10 15	10 17	10 19
6	10 46	10 52	10 58	11 6	11 10	11 14	11 20	11 27	11 30	11 33	11 37	11 41	11 46
7	11 40	11 48	11 58	12 9	12 15	12 22	12 31	12 41	12 46	12 51	12 56	13 3	13 10
8	12 33	12 45	12 57	13 10	13 18	13 28	13 38	13 51	13 58	14 4	14 12	14 20	14 30
9	13 28	13 41	13 54	14 10	14 20	14 30	14 42	14 58	15 5	15 13	15 22	15 32	15 44
10	14 22	14 36	14 50	15 8	15 17	15 29	15 42	15 58	16 6	16 14	16 24	16 35	16 47
11	15 16	15 29	15 44	16 1	16 11	16 22	16 35	16 51	16 59	17 7	17 16	17 27	17 39
12	16 8	16 21	16 34	16 50	17 0	17 10	17 22	17 37	17 44	17 51	18 0	18 10	18 21
13	16 58	17 10	17 22	17 35	17 43	17 52	18 3	18 16	18 22	18 28	18 35	18 43	18 53
14	17 46	17 56	18 6	18 17	18 23	18 30	18 39	18 49	18 54	18 59	19 5	19 11	19 18
15	18 33	18 40	18 47	18 55	19 0	19 5	19 11	19 18	19 22	19 25	19 29	19 34	19 39
16	19 17	19 21	19 26	19 31	19 34	19 37	19 40	19 45	19 47	19 49	19 51	19 54	19 57
17	20 1	20 2	20 3	20 5	20 6	20 7	20 8	20 9	20 10	20 11	20 12	20 12	20 13

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	16 22	16 36	16 50	17 6	17 16	17 27	17 40	17 56	18 3	18 11	18 20	18 30	18 42
1	17 15	17 29	17 44	18 1	18 11	18 23	18 36	18 52	19 0	19 8	19 18	19 29	19 41
2	18 10	18 23	18 38	18 54	19 4	19 15	19 28	19 44	19 51	19 59	20 9	20 19	20 31
3	19 5	19 17	19 30	19 46	19 54	20 4	20 16	20 30	20 36	20 43	20 51	21 0	21 11
4	20 0	20 10	20 21	20 34	20 41	20 49	20 58	21 10	21 15	21 21	21 27	21 34	21 42
5	20 54	21 1	21 10	21 19	21 24	21 30	21 37	21 45	21 49	21 53	21 58	22 2	22 8
6	21 46	21 51	21 56	22 1	22 4	22 8	22 12	22 17	22 19	22 21	22 24	22 27	22 30
7	22 38	22 40	22 41	22 42	22 43	22 44	22 45	22 47	22 47	22 48	22 48	22 49	22 50
8	23 30	23 28	23 26	23 23	23 22	23 20	23 18	23 16	23 15	23 14	23 12	23 11	23 9
9	.....	.....	.....	.....	.....	23 56	23 51	23 46	23 43	23 40	23 37	23 33	23 29
10	0 22	0 17	0 11	0 4	0 1	.....	.....	.....	.....	.....	.....	23 58	23 52
11	1 15	1 6	0 57	0 47	0 42	0 35	0 27	0 18	0 14	0 9	0 4	.....	.....
12	2 8	1 58	1 46	1 33	1 25	1 16	1 6	0 54	0 48	0 42	0 35	0 27	0 18
13	3 3	2 51	2 37	2 21	2 12	2 2	1 50	1 35	1 28	1 21	1 12	1 3	0 52
14	3 59	3 45	3 30	3 13	3 3	2 52	2 39	2 23	2 15	2 7	1 57	1 46	1 34
15	4 54	4 40	4 25	4 8	3 58	3 46	3 33	3 16	3 9	3 0	2 51	2 40	2 27
16	5 47	5 34	5 20	5 4	4 55	4 44	4 31	4 16	4 8	4 0	3 51	3 41	3 29
17	6 39	6 28	6 15	6 1	5 52	5 43	5 32	5 18	5 12	5 5	4 57	4 48	4 38
18	7 28	7 19	7 9	6 57	6 50	6 42	6 33	6 23	6 17	6 12	6 6	5 59	5 50
19	8 15	8 8	8 0	7 52	7 47	7 41	7 35	7 27	7 23	7 19	7 14	7 10	7 4
20	9 0	8 56	8 51	8 46	8 42	8 39	8 35	8 30	8 28	8 26	8 23	8 20	8 16
21	9 43	9 42	9 40	9 38	9 37	9 36	9 34	9 33	9 32	9 31	9 30	9 29	9 28
22	10 26	10 27	10 28	10 30	10 31	10 32	10 33	10 34	10 35	10 36	10 36	10 37	10 38
23	11 8	11 12	11 16	11 21	11 24	11 27	11 31	11 35	11 37	11 40	11 42	11 45	11 48
24	11 51	11 58	12 5	12 13	12 18	12 23	12 29	12 36	12 40	12 44	12 48	12 53	12 58
25	12 36	12 45	12 54	13 5	13 12	13 19	13 28	13 38	13 43	13 48	13 54	14 0	14 8
26	13 22	13 33	13 45	13 58	14 6	14 15	14 26	14 39	14 45	14 51	14 59	15 7	15 17
27	14 11	14 23	14 37	14 52	15 2	15 12	15 24	15 39	15 46	15 54	16 2	16 12	16 23
28	15 2	15 16	15 30	15 47	15 57	16 8	16 21	16 37	16 45	16 53	17 2	17 13	17 25
29	15 56	16 9	16 24	16 41	16 51	17 2	17 15	17 31	17 39	17 47	17 56	18 7	18 19
30	16 51	17 4	17 18	17 34	17 43	17 53	18 6	18 21	18 28	18 35	18 44	18 54	19 5
Feb. 31	17 47	17 58	18 10	18 24	18 32	18 41	18 52	19 4	19 10	19 17	19 24	19 32	19 41
1	18 42	18 51	19 1	19 12	19 18	19 25	19 33	19 43	19 47	19 52	19 58	20 4	20 10
2	19 38	19 44	19 50	19 57	20 1	20 6	20 11	20 17	20 20	20 23	20 27	20 31	20 35
3	20 32	20 34	20 37	20 40	20 42	20 44	20 46	20 49	20 50	20 52	20 53	20 55	20 57
4	21 25	21 24	21 24	21 22	21 22	21 21	21 20	21 20	21 19	21 18	21 18	21 17	21 17
5	22 18	22 14	22 10	22 4	22 2	21 58	21 54	21 50	21 48	21 45	21 43	21 40	21 37
6	23 12	23 4	22 56	22 48	22 42	22 37	22 30	22 22	22 18	22 14	22 10	22 4	21 59
7	.....	23 55	23 44	23 32	23 25	23 17	23 8	22 57	22 51	22 46	22 40	22 32	22 24
8	0 5	.....	.....	.....	.....	.....	23 50	23 36	23 29	23 22	23 14	23 6	22 55
9	0 59	0 47	0 34	0 19	0 11	0 1	.....	.....	.....	.....	23 56	23 46	23 34
10	1 54	1 40	1 26	1 10	1 0	0 49	0 36	0 21	0 13	0 5	.....	.....	.....
11	2 48	2 34	2 19	2 2	1 52	1 41	1 27	1 11	1 3	0 55	0 45	0 34	0 22
12	3 41	3 27	3 13	2 56	2 47	2 36	2 23	2 7	2 0	1 51	1 42	1 32	1 19
13	4 32	4 20	4 7	3 52	3 43	3 33	3 22	3 7	3 0	2 53	2 45	2 36	2 25
14	5 22	5 11	5 0	4 48	4 40	4 32	4 22	4 10	4 4	3 58	3 51	3 44	3 35
15	6 9	6 1	5 52	5 43	5 37	5 30	5 23	5 14	5 9	5 5	4 59	4 54	4 47
16	6 55	6 49	6 43	6 36	6 33	6 28	6 23	6 17	6 14	6 11	6 8	6 4	5 59

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.
For other longitudes and for southern latitudes see page 744.

Data.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb.	16	19 17	19 21	19 26	19 31	19 34	19 37	19 40	19 45	19 47	19 49	19 51	19 54	19 57
	17	20 1	20 2	20 3	20 5	20 6	20 7	20 8	20 9	20 10	20 11	20 12	20 12	20 13
	18	20 43	20 42	20 40	20 38	20 37	20 36	20 35	20 33	20 33	20 32	20 31	20 30	20 29
	19	21 26	21 22	21 17	21 12	21 9	21 6	21 2	20 58	20 56	20 53	20 51	20 48	20 45
	20	22 9	22 2	21 55	21 46	21 42	21 37	21 30	21 23	21 20	21 16	21 12	21 8	21 3
	21	22 53	22 44	22 34	22 23	22 17	22 9	22 1	21 51	21 46	21 41	21 36	21 30	21 23
	22	23 39	23 28	23 16	23 2	22 54	22 45	22 35	22 23	22 17	22 11	22 4	21 56	21 47
	23	....	....	....	23 45	23 36	23 26	23 14	23 0	22 53	22 45	22 37	22 28	22 17
	24	0 26	0 14	0 0	....	....	23 58	23 43	23 35	23 27	23 18	23 8	22 56	22 46
	25	1 17	1 3	0 48	0 32	0 22	0 11	....	....	....	....	....	23 58	23 46
	26	2 9	1 55	1 41	1 24	1 14	1 3	0 50	0 34	0 26	0 18	0 8	....	....
	27	3 3	2 50	2 36	2 20	2 11	2 0	1 48	1 33	1 26	1 18	1 9	0 59	0 48
	28	3 59	3 47	3 35	3 21	3 13	3 4	2 53	2 40	2 33	2 27	2 19	2 10	2 1
Mar.	1	4 54	4 46	4 36	4 25	4 18	4 11	4 3	3 52	3 48	3 42	3 36	3 30	3 22
	2	5 50	5 44	5 38	5 31	5 26	5 22	5 16	5 9	5 6	5 3	4 59	4 55	4 50
	3	6 46	6 44	6 41	6 38	6 36	6 34	6 31	6 28	6 27	6 26	6 24	6 22	6 20
	4	7 41	7 42	7 43	7 45	7 45	7 46	7 47	7 48	7 49	7 49	7 50	7 51	7 52
	5	8 37	8 41	8 46	8 52	8 55	8 58	9 3	9 8	9 10	9 13	9 16	9 19	9 22
	6	9 32	9 40	9 48	9 58	10 3	10 9	10 17	10 26	10 30	10 34	10 39	10 45	10 51
	7	10 28	10 38	10 49	11 2	11 9	11 18	11 28	11 40	11 46	11 52	11 59	12 6	12 16
	8	11 23	11 36	11 49	12 4	12 13	12 23	12 35	12 50	12 56	13 4	13 13	13 22	13 33
	9	12 18	12 32	12 46	13 3	13 13	13 24	13 37	13 53	14 0	14 9	14 18	14 29	14 41
	10	13 12	13 26	13 41	13 58	14 8	14 19	14 32	14 48	14 56	15 4	15 14	15 25	15 37
	11	14 5	14 18	14 32	14 48	14 57	15 8	15 20	15 36	15 43	15 51	16 0	16 10	16 21
	12	14 55	15 7	15 19	15 34	15 42	15 52	16 3	16 16	16 22	16 30	16 37	16 46	16 56
	13	15 43	15 53	16 4	16 16	16 23	16 31	16 40	16 51	16 56	17 2	17 8	17 15	17 23
	14	16 30	16 37	16 46	16 55	17 0	17 6	17 13	17 21	17 25	17 29	17 34	17 39	17 45
	15	17 14	17 20	17 25	17 31	17 34	17 38	17 43	17 48	17 51	17 54	17 56	18 0	18 4
	16	17 58	18 0	18 2	18 5	18 7	18 9	18 11	18 13	18 14	18 16	18 17	18 18	18 20
	17	18 40	18 40	18 40	18 39	18 39	18 38	18 38	18 37	18 37	18 37	18 36	18 36	18 36
	18	19 23	19 20	19 16	19 12	19 10	19 8	19 5	19 1	19 0	18 58	18 56	18 54	18 52
	19	20 6	20 0	19 54	19 47	19 42	19 38	19 33	19 26	19 23	19 20	19 17	19 13	19 9
	20	20 49	20 41	20 32	20 22	20 16	20 10	20 2	19 53	19 49	19 44	19 39	19 34	19 27
	21	21 34	21 24	21 13	21 0	20 53	20 44	20 35	20 23	20 18	20 12	20 5	19 58	19 50
	22	22 21	22 8	21 55	21 41	21 32	21 22	21 11	20 58	20 51	20 44	20 36	20 27	20 17
	23	23 9	22 56	22 42	22 25	22 16	22 5	21 52	21 37	21 30	21 22	21 13	21 3	20 52
	24	23 59	23 45	23 31	23 14	23 4	22 53	22 40	22 24	22 16	22 8	21 58	21 48	21 36
	25	....	....	....	....	23 57	23 46	23 33	23 17	23 10	23 2	22 53	22 42	22 30
	26	0 51	0 37	0 23	0 6	....	....	....	....	....	....	23 56	23 47	23 36
	27	1 44	1 32	1 18	1 4	0 55	0 45	0 33	0 19	0 12	0 5	....	....	....
Apr.	28	2 38	2 28	2 16	2 4	1 57	1 48	1 38	1 27	1 21	1 15	1 8	1 1	0 52
	29	3 33	3 25	3 17	3 7	3 2	2 56	2 49	2 40	2 36	2 32	2 27	2 21	2 15
	30	4 28	4 23	4 18	4 13	4 10	4 6	4 2	3 57	3 55	3 52	3 50	3 47	3 43
	31	5 23	5 22	5 21	5 20	5 20	5 19	5 18	5 17	5 16	5 16	5 15	5 15	5 14
	1	6 20	6 22	6 25	6 28	6 30	6 32	6 35	6 38	6 40	6 41	6 43	6 45	6 47
	2	7 16	7 23	7 29	7 37	7 41	7 46	7 52	7 59	8 2	8 6	8 10	8 14	8 20
	3	8 14	8 23	8 33	8 44	8 51	8 59	9 8	9 18	9 23	9 29	9 35	9 42	9 50

TABLE X.

731

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Feb. 16	h m 6 55	h m 6 49	h m 6 43	h m 6 36	h m 6 33	h m 6 28	h m 6 23	h m 6 17	h m 6 14	h m 6 11	h m 6 8	h m 6 4	h m 5 59
17	7 38	7 36	7 33	7 30	7 28	7 25	7 23	7 20	7 18	7 17	7 15	7 13	7 11
18	8 21	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22	8 22
19	9 4	9 7	9 10	9 13	9 15	9 18	9 20	9 23	9 25	9 26	9 28	9 30	9 32
20	9 46	9 52	9 58	10 5	10 9	10 13	10 18	10 24	10 27	10 30	10 34	10 38	10 42
21	10 30	10 38	10 46	10 56	11 2	11 8	11 16	11 25	11 29	11 34	11 39	11 45	11 51
22	11 15	11 25	11 36	11 48	11 56	12 4	12 14	12 25	12 30	12 36	12 43	12 51	12 59
23	12 2	12 14	12 26	12 41	12 50	12 59	13 11	13 25	13 31	13 38	13 46	13 55	14 6
24	12 50	13 4	13 18	13 34	13 44	13 54	14 7	14 22	14 30	14 38	14 47	14 57	15 8
25	13 42	13 55	14 10	14 27	14 37	14 48	15 1	15 17	15 25	15 33	15 42	15 53	16 5
26	14 35	14 48	15 3	15 19	15 29	15 40	15 52	16 8	16 15	16 23	16 32	16 42	16 54
27	15 30	15 42	15 55	16 10	16 19	16 28	16 40	16 54	17 0	17 8	17 16	17 24	17 35
28	16 25	16 36	16 46	16 59	17 6	17 14	17 24	17 35	17 40	17 46	17 52	18 0	18 7
Mar. 1	17 21	17 29	17 37	17 46	17 51	17 57	18 4	18 12	18 16	18 20	18 24	18 29	18 35
2	18 17	18 21	18 26	18 31	18 34	18 37	18 41	18 45	18 47	18 50	18 52	18 55	18 58
3	19 12	19 13	19 14	19 15	19 15	19 16	19 17	19 18	19 18	19 18	19 19	19 19	19 20
4	20 8	20 5	20 2	19 58	19 57	19 54	19 52	19 49	19 48	19 46	19 44	19 43	19 41
5	21 3	20 57	20 50	20 43	20 39	20 34	20 28	20 21	20 18	20 15	20 11	20 7	20 3
6	21 58	21 49	21 40	21 29	21 22	21 15	21 6	20 57	20 52	20 47	20 41	20 35	20 28
7	22 54	22 43	22 30	22 16	22 8	21 59	21 48	21 35	21 29	21 23	21 15	21 7	20 58
8	23 50	23 36	23 23	23 6	22 57	22 47	22 34	22 19	22 12	22 4	21 56	21 46	21 34
9	.....	.....	.....	23 59	23 49	23 38	23 24	23 8	23 1	22 52	22 43	22 32	22 20
10	0 44	0 30	0 16	.....	.....	.....	.....	.....	23 55	23 47	23 37	23 27	23 14
11	1 38	1 24	1 9	0 53	0 43	0 32	0 19	0 3	.....	.....	.....	.....	.....
12	2 29	2 17	2 3	1 48	1 38	1 28	1 16	1 1	0 54	0 46	0 38	0 28	0 17
13	3 19	3 8	2 56	2 42	2 35	2 26	2 15	2 2	1 56	1 50	1 42	1 34	1 25
14	4 6	3 57	3 48	3 37	3 31	3 23	3 15	3 5	3 0	2 55	2 49	2 43	2 35
15	4 52	4 45	4 38	4 31	4 26	4 21	4 15	4 8	4 4	4 1	3 57	3 52	3 47
16	5 36	5 32	5 28	5 24	5 21	5 18	5 14	5 10	5 8	5 6	5 4	5 1	4 59
17	6 19	6 18	6 17	6 16	6 15	6 14	6 13	6 12	6 12	6 11	6 11	6 10	6 10
18	7 1	7 3	7 5	7 7	7 9	7 10	7 12	7 14	7 15	7 16	7 17	7 18	7 20
19	7 44	7 48	7 53	7 59	8 2	8 6	8 10	8 15	8 18	8 20	8 23	8 26	8 30
20	8 27	8 34	8 42	8 50	8 55	9 1	9 8	9 16	9 20	9 24	9 28	9 33	9 39
21	9 11	9 20	9 31	9 42	9 49	9 56	10 5	10 16	10 21	10 27	10 33	10 40	10 47
22	9 57	10 8	10 20	10 34	10 42	10 52	11 2	11 15	11 22	11 28	11 36	11 44	11 54
23	10 44	10 57	11 10	11 26	11 35	11 46	11 58	12 13	12 20	12 28	12 36	12 46	12 57
24	11 33	11 47	12 1	12 18	12 28	12 39	12 52	13 8	13 15	13 24	13 33	13 43	13 56
25	12 24	12 38	12 52	13 9	13 19	13 30	13 43	13 59	14 6	14 15	14 24	14 34	14 46
26	13 16	13 28	13 43	13 59	14 8	14 18	14 31	14 45	14 52	15 0	15 9	15 18	15 29
27	14 10	14 21	14 33	14 47	14 55	15 4	15 15	15 27	15 33	15 40	15 47	15 55	16 4
28	15 4	15 13	15 23	15 34	15 40	15 47	15 55	16 5	16 10	16 14	16 20	16 26	16 33
29	15 59	16 5	16 11	16 19	16 23	16 28	16 33	16 40	16 43	16 46	16 49	16 53	16 58
30	16 54	16 57	17 0	17 3	17 5	17 7	17 9	17 12	17 13	17 15	17 16	17 18	17 20
31	17 50	17 49	17 48	17 47	17 46	17 46	17 45	17 44	17 43	17 43	17 42	17 42	17 41
Apr. 1	18 46	18 42	18 37	18 32	18 29	18 25	18 21	18 16	18 14	18 12	18 9	18 6	18 3
2	19 43	19 36	19 28	19 18	19 13	19 6	18 59	18 51	18 47	18 43	18 38	18 32	18 27
3	20 41	20 31	20 20	20 7	20 0	19 51	19 41	19 29	19 24	19 18	19 11	19 4	18 55

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr.	1	6 20	6 22	6 25	6 28	6 30	6 32	6 35	6 38	6 40	6 41	6 43	6 45	6 47
	2	7 16	7 23	7 29	7 37	7 41	7 46	7 52	7 59	8 2	8 6	8 10	8 14	8 20
	3	8 14	8 23	8 33	8 44	8 51	8 59	9 8	9 18	9 23	9 29	9 35	9 42	9 50
	4	9 12	9 24	9 36	9 50	9 59	10 8	10 20	10 33	10 40	10 47	10 55	11 4	11 14
	5	10 9	10 22	10 37	10 53	11 3	11 14	11 26	11 42	11 49	11 57	12 7	12 17	12 29
	6	11 6	11 20	11 34	11 51	12 1	12 13	12 26	12 42	12 50	12 59	13 8	13 19	13 32
	7	12 0	12 14	12 28	12 45	12 54	13 5	13 17	13 34	13 41	13 50	13 59	14 9	14 21
	8	12 52	13 4	13 18	13 33	13 42	13 52	14 3	14 17	14 24	14 31	14 39	14 49	14 59
	9	13 41	13 52	14 3	14 16	14 24	14 32	14 42	14 54	14 59	15 5	15 12	15 20	15 28
	10	14 28	14 37	14 46	14 56	15 2	15 8	15 16	15 25	15 29	15 34	15 39	15 45	15 52
	11	15 13	15 19	15 25	15 32	15 37	15 41	15 46	15 53	15 56	15 59	16 2	16 6	16 11
	12	15 57	16 0	16 3	16 7	16 9	16 12	16 15	16 18	16 20	16 21	16 23	16 25	16 28
	13	16 39	16 40	16 40	16 40	16 41	16 41	16 42	16 42	16 42	16 43	16 43	16 43	16 43
	14	17 22	17 19	17 17	17 14	17 12	17 11	17 8	17 6	17 5	17 3	17 2	17 0	16 59
	15	18 4	17 59	17 54	17 47	17 44	17 40	17 36	17 30	17 28	17 25	17 22	17 19	17 15
	16	18 47	18 40	18 32	18 23	18 17	18 12	18 5	17 56	17 52	17 48	17 44	17 39	17 33
	17	19 32	19 22	19 12	19 0	18 53	18 45	18 36	18 25	18 20	18 15	18 8	18 2	17 54
	18	20 18	20 6	19 54	19 39	19 31	19 22	19 11	18 58	18 52	18 45	18 37	18 29	18 19
	19	21 5	20 52	20 38	20 22	20 13	20 3	19 50	19 35	19 28	19 20	19 12	19 2	18 51
	20	21 54	21 41	21 26	21 9	20 59	20 48	20 35	20 19	20 11	20 3	19 54	19 43	19 31
	21	22 45	22 31	22 16	22 0	21 50	21 38	21 25	21 9	21 2	20 53	20 44	20 33	20 21
	22	23 36	23 23	23 10	22 54	22 44	22 34	22 22	22 6	21 59	21 52	21 43	21 33	21 22
	23	.....	.....	.....	23 51	23 43	23 34	23 23	23 10	23 4	22 57	22 50	22 41	22 31
	24	0 28	0 17	0 5	.....	.....	.....	.....	.....	.....	.....	.....	23 56	23 49
	25	1 21	1 12	1 2	0 51	0 45	0 37	0 29	0 19	0 14	0 9	0 3	.....	.....
	26	2 14	2 8	2 1	1 53	1 49	1 44	1 38	1 32	1 28	1 25	1 21	1 17	1 12
	27	3 7	3 4	3 1	2 58	2 56	2 54	2 51	2 48	2 47	2 45	2 43	2 41	2 39
	28	4 2	4 2	4 3	4 4	4 4	4 5	4 6	4 7	4 7	4 8	4 8	4 9	4 9
	29	4 57	5 2	5 6	5 12	5 15	5 18	5 22	5 27	5 30	5 32	5 35	5 38	5 42
	30	5 55	6 2	6 11	6 20	6 26	6 32	6 39	6 48	6 52	6 57	7 2	7 8	7 14
May	1	6 53	7 4	7 15	7 28	7 36	7 45	7 55	8 7	8 13	8 19	8 26	8 34	8 44
	2	7 53	8 5	8 19	8 35	8 44	8 54	9 7	9 22	9 29	9 37	9 45	9 55	10 7
	3	8 52	9 6	9 20	9 38	9 48	9 59	10 12	10 29	10 36	10 45	10 54	11 6	11 18
	4	9 49	10 3	10 18	10 35	10 45	10 57	11 10	11 26	11 34	11 43	11 52	12 3	12 16
	5	10 44	10 57	11 11	11 28	11 37	11 47	12 0	12 15	12 22	12 30	12 38	12 48	13 0
	6	11 36	11 48	12 0	12 14	12 22	12 31	12 42	12 55	13 1	13 8	13 15	13 23	13 33
	7	12 25	12 34	12 44	12 56	13 2	13 10	13 18	13 28	13 33	13 39	13 44	13 51	13 58
	8	13 11	13 18	13 25	13 34	13 38	13 44	13 50	13 58	14 1	14 5	14 9	14 14	14 19
	9	13 55	13 59	14 4	14 9	14 12	14 15	14 19	14 23	14 26	14 28	14 30	14 33	14 36
	10	14 38	14 39	14 41	14 43	14 44	14 45	14 46	14 48	14 48	14 49	14 50	14 51	14 52
	11	15 20	15 19	15 17	15 16	15 15	15 14	15 13	15 11	15 10	15 10	15 9	15 8	15 7
	12	16 3	15 58	15 54	15 49	15 46	15 43	15 39	15 35	15 33	15 31	15 28	15 26	15 23
	13	16 46	16 39	16 32	16 24	16 19	16 14	16 7	16 0	15 57	15 53	15 49	15 45	15 40
	14	17 30	17 21	17 11	17 0	16 53	16 46	16 38	16 28	16 23	16 18	16 12	16 6	15 59
	15	18 15	18 4	17 52	17 39	17 31	17 22	17 11	16 59	16 53	16 47	16 40	16 32	16 22
	16	19 3	18 50	18 36	18 21	18 12	18 1	17 49	17 35	17 28	17 21	17 12	17 3	16 52
	17	19 52	19 38	19 23	19 6	18 57	18 46	18 32	18 16	18 9	18 1	17 52	17 41	17 29

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Data.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	18 46	18 42	18 37	18 32	18 29	18 25	18 21	18 16	18 14	18 12	18 9	18 6	18 3
2	19 43	19 36	19 28	19 18	19 13	19 6	18 59	18 51	18 47	18 43	18 38	18 32	18 27
3	20 41	20 31	20 20	20 7	20 0	19 51	19 41	19 29	19 24	19 18	19 11	19 4	18 55
4	21 39	21 27	21 13	20 58	20 49	20 39	20 27	20 12	20 6	19 58	19 50	19 41	19 30
5	22 36	22 23	22 8	21 51	21 42	21 30	21 17	21 1	20 54	20 46	20 36	20 26	20 13
6	23 32	23 18	23 3	22 46	22 36	22 25	22 12	21 56	21 48	21 39	21 30	21 19	21 6
7	....	....	23 58	23 42	23 33	23 22	23 9	22 54	22 47	22 39	22 30	22 20	22 8
8	0 25	0 12	....	....	....	....	....	23 55	23 49	23 42	23 34	23 25	23 15
9	1 16	1 4	0 52	0 38	0 29	0 20	0 9	....	....	....	....	....	....
10	2 4	1 55	1 44	1 33	1 26	1 18	1 9	0 58	0 53	0 47	0 41	0 34	0 26
11	2 50	2 43	2 35	2 27	2 21	2 16	2 9	2 1	1 57	1 53	1 48	1 43	1 37
12	3 34	3 30	3 25	3 19	3 16	3 12	3 8	3 3	3 1	2 58	2 55	2 52	2 48
13	4 17	4 16	4 14	4 11	4 10	4 8	4 7	4 5	4 4	4 3	4 2	4 0	3 59
14	5 0	5 1	5 2	5 3	5 4	5 4	5 5	5 6	5 7	5 7	5 8	5 8	5 9
15	5 42	5 46	5 50	5 54	5 57	6 0	6 3	6 7	6 9	6 12	6 14	6 16	6 19
16	6 25	6 31	6 38	6 46	6 50	6 55	7 2	7 9	7 12	7 16	7 20	7 24	7 29
17	7 9	7 18	7 27	7 38	7 44	7 51	7 59	8 9	8 14	8 19	8 25	8 31	8 38
18	7 54	8 5	8 17	8 30	8 38	8 46	8 57	9 9	9 15	9 21	9 29	9 37	9 46
19	8 41	8 53	9 7	9 22	9 31	9 41	9 53	10 8	10 14	10 22	10 30	10 40	10 51
20	9 29	9 43	9 57	10 14	10 23	10 34	10 47	11 3	11 11	11 19	11 28	11 39	11 51
21	10 19	10 33	10 48	11 4	11 14	11 26	11 39	11 55	12 3	12 11	12 21	12 31	12 44
22	11 10	11 23	11 37	11 54	12 3	12 14	12 27	12 42	12 50	12 58	13 6	13 17	13 28
23	12 1	12 13	12 26	12 41	12 50	13 0	13 11	13 25	13 31	13 38	13 46	13 55	14 5
24	12 53	13 3	13 14	13 27	13 34	13 42	13 51	14 2	14 8	14 13	14 20	14 27	14 35
25	13 46	13 54	14 2	14 11	14 16	14 22	14 29	14 37	14 41	14 45	14 49	14 54	15 0
26	14 39	14 43	14 48	14 54	14 57	15 0	15 4	15 9	15 11	15 13	15 16	15 19	15 22
27	15 33	15 34	15 35	15 36	15 37	15 38	15 39	15 40	15 40	15 41	15 41	15 42	15 42
28	16 28	16 25	16 23	16 19	16 18	16 16	16 13	16 11	16 9	16 8	16 6	16 5	16 3
29	17 24	17 18	17 12	17 4	17 0	16 56	16 50	16 44	16 41	16 37	16 34	16 30	16 25
30	18 22	18 13	18 3	17 52	17 46	17 38	17 30	17 20	17 15	17 10	17 4	16 58	16 51
May 1	19 22	19 10	18 57	18 43	18 35	18 25	18 14	18 1	17 55	17 48	17 40	17 32	17 22
2	20 21	20 8	19 53	19 37	19 27	19 16	19 4	18 48	18 41	18 33	18 24	18 14	18 2
3	21 20	21 6	20 51	20 33	20 23	20 12	19 58	19 42	19 34	19 26	19 16	19 5	18 52
4	22 16	22 2	21 48	21 31	21 21	21 10	20 57	20 41	20 33	20 25	20 15	20 4	19 52
5	23 10	22 57	22 44	22 28	22 20	22 10	21 58	21 43	21 36	21 29	21 20	21 11	21 0
6	....	23 50	23 38	23 25	23 18	23 9	22 59	22 47	22 42	22 35	22 28	22 20	22 11
7	0 0	....	....	....	....	....	....	23 51	23 47	23 42	23 37	23 31	23 24
8	0 43	0 39	0 31	0 21	0 15	0 8	0 0	....	....	....	....	....	....
9	1 33	1 27	1 21	1 14	1 10	1 6	1 1	0 55	0 52	0 48	0 45	0 41	0 36
10	2 16	2 13	2 10	2 7	2 5	2 2	2 0	1 57	1 56	1 54	1 52	1 50	1 48
11	2 59	2 59	2 59	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58	2 58
12	3 41	3 44	3 46	3 50	3 52	3 54	3 57	4 0	4 1	4 3	4 4	4 6	4 8
13	4 23	4 29	4 35	4 41	4 45	4 49	4 55	5 1	5 4	5 7	5 10	5 14	5 18
14	5 7	5 15	5 24	5 33	5 39	5 45	5 53	6 2	6 6	6 11	6 16	6 22	6 28
15	5 52	6 2	6 13	6 26	6 33	6 41	6 51	7 3	7 8	7 14	7 21	7 28	7 37
16	6 38	6 50	7 3	7 18	7 27	7 37	7 48	8 2	8 9	8 16	8 24	8 33	8 44
17	7 26	7 40	7 54	8 10	8 20	8 31	8 44	8 59	9 7	9 15	9 24	9 34	9 46

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Data.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	19 52	19 38	19 23	19 6	18 57	18 46	18 32	18 16	18 9	18 1	17 52	17 41	17 29
18	20 42	20 28	20 13	19 56	19 46	19 35	19 21	19 5	18 57	18 49	18 39	18 28	18 16
19	21 33	21 20	21 5	20 49	20 39	20 28	20 15	20 0	19 52	19 44	19 35	19 24	19 13
20	22 24	22 12	21 59	21 44	21 36	21 26	21 14	21 0	20 54	20 47	20 39	20 29	20 19
21	23 16	23 6	22 55	22 43	22 35	22 27	22 18	22 6	22 1	21 55	21 49	21 41	21 33
22	...	...	23 52	23 43	23 37	23 31	23 24	23 16	23 12	23 8	23 3	22 58	22 52
23	0 7	0 0	...	...	...	...	...	...	...	...	...	...	...
24	0 58	0 54	0 49	0 44	0 41	0 38	0 34	0 29	0 27	0 24	0 22	0 19	0 15
25	1 50	1 49	1 48	1 47	1 46	1 46	1 45	1 44	1 44	1 43	1 43	1 42	1 41
26	2 43	2 46	2 49	2 52	2 54	2 56	2 58	3 1	3 2	3 4	3 6	3 8	3 10
27	3 38	3 44	3 51	3 58	4 2	4 7	4 13	4 20	4 23	4 26	4 30	4 35	4 40
28	4 35	4 44	4 54	5 5	5 12	5 19	5 28	5 39	5 44	5 49	5 55	6 2	6 10
29	5 34	5 46	5 58	6 13	6 21	6 31	6 42	6 56	7 2	7 10	7 18	7 27	7 37
30	6 33	6 47	7 1	7 18	7 28	7 39	7 52	8 8	8 15	8 24	8 33	8 44	8 56
31	7 33	7 47	8 2	8 20	8 30	8 41	8 55	9 12	9 20	9 28	9 38	9 50	10 2
June 1	8 31	8 44	8 59	9 16	9 26	9 37	9 50	10 6	10 14	10 22	10 31	10 42	10 54
2	9 26	9 38	9 51	10 7	10 15	10 25	10 37	10 51	10 58	11 5	11 14	11 23	11 33
3	10 17	10 28	10 39	10 52	10 59	11 7	11 17	11 29	11 34	11 40	11 47	11 54	12 3
4	11 6	11 14	11 22	11 32	11 38	11 44	11 51	12 1	12 4	12 9	12 14	12 19	12 26
5	11 52	11 57	12 3	12 9	12 13	12 17	12 22	12 28	12 31	12 34	12 37	12 40	12 44
6	12 35	12 38	12 41	12 44	12 46	12 48	12 50	12 53	12 54	12 55	12 57	12 59	13 0
7	13 18	13 18	13 18	13 17	13 17	13 17	13 17	13 16	13 16	13 16	13 16	13 16	13 16
8	14 0	13 57	13 54	13 50	13 48	13 46	13 43	13 40	13 38	13 37	13 35	13 33	13 31
9	14 43	14 37	14 31	14 24	14 20	14 16	14 11	14 4	14 2	13 58	13 55	13 51	13 47
10	15 26	15 18	15 10	15 0	14 54	14 47	14 40	14 31	14 27	14 22	14 17	14 11	14 5
11	16 12	16 1	15 50	15 37	15 30	15 22	15 12	15 0	14 55	14 49	14 42	14 35	14 27
12	16 59	16 46	16 33	16 18	16 10	16 0	15 48	15 34	15 28	15 21	15 13	15 4	14 54
13	17 48	17 34	17 20	17 3	16 53	16 42	16 30	16 14	16 6	15 59	15 50	15 39	15 27
14	18 38	18 24	18 9	17 52	17 42	17 30	17 17	17 0	16 52	16 44	16 34	16 23	16 11
15	19 29	19 16	19 1	18 44	18 34	18 23	18 9	17 53	17 46	17 37	17 28	17 17	17 5
16	20 21	20 9	19 55	19 39	19 30	19 20	19 8	18 53	18 46	18 38	18 30	18 20	18 9
17	21 13	21 2	20 51	20 37	20 30	20 21	20 10	19 58	19 52	19 46	19 39	19 31	19 21
18	22 4	21 56	21 47	21 37	21 31	21 24	21 16	21 7	21 2	20 57	20 52	20 46	20 39
19	22 55	22 50	22 44	22 37	22 33	22 29	22 24	22 18	22 15	22 12	22 8	22 5	22 0
20	23 46	23 44	23 41	23 39	23 37	23 35	23 33	23 31	23 30	23 28	23 27	23 26	23 24
21	...	...	...	...	...	...	...	...	...	...	...	...	...
22	0 37	0 38	0 40	0 41	0 42	0 43	0 44	0 45	0 46	0 47	0 48	0 48	0 49
23	1 30	1 34	1 39	1 45	1 48	1 52	1 56	2 1	2 3	2 6	2 9	2 12	2 16
24	2 24	2 31	2 40	2 49	2 55	3 1	3 9	3 18	3 22	3 26	3 31	3 37	3 43
25	3 20	3 30	3 41	3 54	4 2	4 11	4 21	4 33	4 39	4 46	4 53	5 1	5 10
26	4 17	4 30	4 44	4 59	5 9	5 19	5 31	5 46	5 54	6 2	6 10	6 20	6 32
27	5 16	5 30	5 45	6 2	6 12	6 24	6 37	6 54	7 2	7 10	7 20	7 31	7 44
28	6 15	6 29	6 44	7 1	7 11	7 23	7 37	7 53	8 1	8 10	8 20	8 31	8 44
29	7 12	7 25	7 39	7 55	8 5	8 15	8 28	8 43	8 51	8 59	9 8	9 18	9 29
30	8 6	8 17	8 30	8 44	8 52	9 1	9 12	9 25	9 32	9 38	9 46	9 54	10 4
July 1	8 57	9 6	9 16	9 27	9 34	9 41	9 50	10 0	10 5	10 10	10 16	10 22	10 30
2	9 44	9 51	9 58	10 7	10 11	10 16	10 23	10 30	10 33	10 37	10 41	10 46	10 51

TABLE X.

735

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Data.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
May 17	h m 7 26	h m 7 40	h m 7 54	h m 8 10	h m 8 20	h m 8 31	h m 8 44	h m 8 59	h m 9 7	h m 9 15	h m 9 24	h m 9 34	h m 9 46
18	8 16	8 30	8 45	9 2	9 12	9 24	9 37	9 53	10 1	10 9	10 19	10 30	10 42
19	9 7	9 20	9 35	9 52	10 2	10 13	10 26	10 42	10 50	10 58	11 7	11 18	11 30
20	9 58	10 10	10 24	10 40	10 49	10 59	11 11	11 26	11 33	11 40	11 48	11 58	12 9
21	10 49	11 0	11 12	11 25	11 33	11 42	11 52	12 5	12 10	12 17	12 24	12 31	12 40
22	11 40	11 49	11 58	12 9	12 15	12 22	12 30	12 39	12 43	12 48	12 54	12 59	13 6
23	12 31	12 38	12 44	12 50	12 55	12 59	13 4	13 11	13 14	13 17	13 20	13 24	13 29
24	13 23	13 26	13 28	13 32	13 33	13 35	13 38	13 40	13 42	13 43	13 44	13 46	13 48
25	14 15	14 14	14 14	14 13	14 12	14 11	14 11	14 10	14 9	14 9	14 8	14 8	14 7
26	15 9	15 5	15 0	14 54	14 52	14 48	14 44	14 40	14 37	14 35	14 33	14 30	14 27
27	16 5	15 57	15 49	15 40	15 35	15 29	15 22	15 13	15 10	15 5	15 1	14 56	14 50
28	17 3	16 52	16 41	16 28	16 21	16 12	16 2	15 51	15 45	15 39	15 33	15 25	15 17
29	18 2	17 50	17 36	17 20	17 11	17 1	16 49	16 34	16 28	16 20	16 12	16 2	15 51
30	19 2	18 48	18 33	18 16	18 6	17 54	17 41	17 25	17 17	17 9	16 59	16 48	16 36
31	20 1	19 47	19 32	19 14	19 4	18 52	18 39	18 22	18 14	18 6	17 56	17 45	17 32
June 1	20 57	20 44	20 30	20 14	20 4	19 53	19 40	19 25	19 18	19 9	19 0	18 50	18 38
2	21 51	21 39	21 27	21 13	21 4	20 55	20 44	20 30	20 24	20 17	20 9	20 0	19 50
3	22 41	22 32	22 22	22 10	22 4	21 56	21 47	21 36	21 31	21 26	21 20	21 13	21 5
4	23 28	23 22	23 14	23 6	23 1	22 56	22 49	22 42	22 38	22 34	22 30	22 25	22 19
5	.....	.....	.....	.....	23 57	23 54	23 50	23 45	23 43	23 41	23 39	23 36	23 32
6	0 13	0 9	0 5	0 0	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	0 56	0 55	0 54	0 52	0 52	0 50	0 49	0 48	0 47	0 47	0 46	0 45	0 44
8	1 38	1 40	1 42	1 44	1 45	1 46	1 48	1 50	1 50	1 51	1 52	1 54	1 55
9	2 21	2 25	2 30	2 36	2 39	2 42	2 46	2 51	2 53	2 56	2 59	3 2	3 5
10	3 4	3 11	3 18	3 27	3 32	3 38	3 44	3 52	3 56	4 0	4 5	4 9	4 15
11	3 48	3 58	4 8	4 19	4 26	4 34	4 43	4 53	4 58	5 4	5 10	5 17	5 25
12	4 34	4 46	4 58	5 12	5 20	5 30	5 41	5 54	6 0	6 7	6 15	6 23	6 33
13	5 22	5 35	5 49	6 5	6 14	6 25	6 38	6 53	7 0	7 8	7 17	7 26	7 38
14	6 12	6 26	6 41	6 58	7 8	7 19	7 32	7 49	7 56	8 5	8 14	8 25	8 38
15	7 3	7 17	7 32	7 49	7 59	8 10	8 24	8 40	8 48	8 56	9 6	9 17	9 29
16	7 54	8 8	8 23	8 38	8 48	8 59	9 11	9 26	9 34	9 42	9 50	10 0	10 12
17	8 46	8 58	9 11	9 25	9 33	9 43	9 54	10 7	10 14	10 20	10 28	10 36	10 46
18	9 38	9 48	9 58	10 10	10 16	10 24	10 33	10 43	10 48	10 54	11 0	11 6	11 14
19	10 29	10 36	10 43	10 52	10 56	11 2	11 8	11 15	11 19	11 22	11 27	11 31	11 36
20	11 20	11 23	11 27	11 32	11 35	11 38	11 41	11 45	11 47	11 49	11 51	11 54	11 56
21	12 10	12 11	12 12	12 12	12 12	12 13	12 13	12 14	12 14	12 14	12 14	12 15	12 15
22	13 2	12 59	12 56	12 52	12 51	12 48	12 46	12 43	12 41	12 40	12 38	12 36	12 34
23	13 55	13 49	13 42	13 35	13 30	13 26	13 20	13 13	13 10	13 7	13 3	12 59	12 54
24	14 50	14 41	14 31	14 20	14 13	14 6	13 57	13 47	13 42	13 38	13 32	13 25	13 18
25	15 47	15 35	15 22	15 8	15 0	14 51	14 40	14 26	14 20	14 14	14 6	13 57	13 48
26	16 45	16 32	16 18	16 1	15 51	15 40	15 28	15 12	15 5	14 57	14 48	14 37	14 26
27	17 44	17 30	17 15	16 57	16 47	16 36	16 22	16 5	15 57	15 49	15 39	15 28	15 15
28	18 42	18 28	18 13	17 56	17 46	17 35	17 22	17 5	16 58	16 49	16 39	16 28	16 16
29	19 38	19 25	19 12	18 56	18 47	18 37	18 25	18 10	18 3	17 56	17 47	17 37	17 26
30	20 30	20 20	20 8	19 56	19 48	19 39	19 29	19 17	19 11	19 5	18 58	18 50	18 41
July 1	21 20	21 12	21 3	20 53	20 48	20 41	20 33	20 24	20 20	20 15	20 10	20 4	19 57
2	22 7	22 1	21 56	21 49	21 45	21 41	21 36	21 30	21 27	21 24	21 21	21 17	21 13

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.
For other longitudes and for southern latitudes see page 744.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	8 57	9 6	9 16	9 27	9 34	9 41	9 50	10 0	10 5	10 10	10 16	10 22	10 30
	2	9 44	9 51	9 58	10 7	10 11	10 16	10 23	10 30	10 33	10 37	10 41	10 46	10 51
	3	10 30	10 34	10 38	10 43	10 46	10 49	10 52	10 56	10 58	11 0	11 3	11 6	11 8
	4	11 14	11 15	11 16	11 17	11 18	11 19	11 20	11 21	11 21	11 22	11 23	11 23	11 24
	5	11 56	11 55	11 53	11 51	11 49	11 48	11 46	11 44	11 43	11 43	11 42	11 40	11 39
	6	12 39	12 34	12 30	12 24	12 21	12 18	12 13	12 8	12 6	12 4	12 1	11 58	11 55
	7	13 22	13 15	13 7	12 59	12 54	12 48	12 42	12 34	12 30	12 26	12 22	12 17	12 12
	8	14 6	13 57	13 47	13 35	13 29	13 21	13 12	13 2	12 57	12 52	12 46	12 39	12 32
	9	14 52	14 41	14 29	14 15	14 7	13 57	13 47	13 34	13 28	13 21	13 14	13 5	12 56
	10	15 41	15 28	15 14	14 58	14 48	14 38	14 26	14 11	14 4	13 56	13 47	13 38	13 26
	11	16 31	16 17	16 2	15 45	15 35	15 24	15 10	14 54	14 46	14 38	14 28	14 18	14 6
	12	17 22	17 8	16 53	16 36	16 26	16 15	16 1	15 45	15 37	15 29	15 19	15 8	14 56
	13	18 15	18 2	17 48	17 31	17 22	17 11	16 58	16 43	16 36	16 28	16 19	16 8	15 56
	14	19 8	18 56	18 44	18 30	18 21	18 12	18 1	17 47	17 41	17 34	17 26	17 17	17 7
	15	20 1	19 51	19 41	19 30	19 23	19 15	19 6	18 56	18 51	18 46	18 39	18 32	18 25
	16	20 52	20 46	20 39	20 31	20 26	20 21	20 15	20 8	20 4	20 0	19 56	19 52	19 47
	17	21 44	21 40	21 37	21 33	21 30	21 28	21 25	21 21	21 19	21 17	21 15	21 13	21 10
	18	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35	22 35
	19	23 26	23 30	23 33	23 38	23 40	23 43	23 46	23 50	23 52	23 54	23 56	23 58	...
	20	....	....	....	....	....	....	....	....	....	....	....	....	0 1
	21	0 19	0 26	0 33	0 41	0 45	0 51	0 57	1 5	1 8	1 12	1 16	1 21	1 27
	22	1 13	1 22	1 33	1 44	1 51	1 59	2 8	2 19	2 24	2 30	2 36	2 43	2 51
	23	2 8	2 20	2 33	2 48	2 56	3 6	3 17	3 31	3 38	3 45	3 53	4 3	4 13
	24	3 5	3 18	3 33	3 50	3 59	4 10	4 24	4 40	4 47	4 55	5 5	5 16	5 28
	25	4 2	4 16	4 31	4 49	4 59	5 11	5 25	5 41	5 49	5 58	6 8	6 19	6 32
	26	4 59	5 13	5 27	5 44	5 54	6 5	6 18	6 34	6 42	6 50	7 0	7 10	7 23
	27	5 54	6 6	6 19	6 35	6 44	6 54	7 6	7 20	7 26	7 34	7 42	7 51	8 2
	28	6 46	6 57	7 8	7 21	7 28	7 36	7 46	7 58	8 3	8 9	8 16	8 23	8 32
	29	7 36	7 44	7 52	8 2	8 8	8 14	8 21	8 30	8 34	8 39	8 43	8 49	8 55
	30	8 23	8 28	8 34	8 40	8 44	8 48	8 52	8 58	9 1	9 4	9 7	9 10	9 14
Aug.	31	9 8	9 10	9 13	9 15	9 17	9 19	9 21	9 24	9 25	9 26	9 28	9 29	9 31
	1	9 51	9 51	9 50	9 50	9 49	9 49	9 48	9 48	9 48	9 48	9 47	9 47	9 47
	2	10 34	10 31	10 27	10 23	10 21	10 19	10 16	10 12	10 10	10 9	10 7	10 5	10 2
	3	11 17	11 11	11 4	10 57	10 53	10 49	10 43	10 37	10 34	10 30	10 27	10 23	10 18
	4	12 1	11 52	11 43	11 33	11 27	11 20	11 13	11 3	10 59	10 54	10 49	10 44	10 37
	5	12 46	12 35	12 24	12 11	12 3	11 55	11 45	11 33	11 28	11 22	11 15	11 7	10 59
	6	13 32	13 20	13 7	12 52	12 43	12 33	12 22	12 8	12 1	11 54	11 46	11 36	11 26
	7	14 21	14 8	13 53	13 37	13 27	13 16	13 3	12 48	12 40	12 32	12 23	12 13	12 1
	8	15 12	14 58	14 43	14 26	14 16	14 4	13 51	13 35	13 27	13 18	13 9	12 58	12 46
	9	16 4	15 51	15 36	15 19	15 10	14 58	14 45	14 30	14 22	14 14	14 4	13 54	13 42
	10	16 58	16 45	16 32	16 17	16 8	15 58	15 46	15 32	15 25	15 17	15 9	14 59	14 48
	11	17 51	17 41	17 30	17 17	17 10	17 1	16 51	16 39	16 34	16 28	16 21	16 13	16 4
	12	18 45	18 37	18 28	18 19	18 14	18 7	18 0	17 51	17 47	17 43	17 38	17 32	17 26
	13	19 38	19 33	19 28	19 22	19 19	19 16	19 11	19 6	19 4	19 1	18 58	18 55	18 52
	14	20 30	20 29	20 28	20 26	20 25	20 24	20 23	20 22	20 21	20 21	20 20	20 19	20 18
	15	21 23	21 25	21 27	21 30	21 32	21 34	21 36	21 38	21 39	21 41	21 42	21 44	21 45
	16	22 16	22 21	22 27	22 34	22 38	22 43	22 48	22 54	22 57	23 0	23 4	23 8	23 13

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Date.													
July	1	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
	2	21 20	21 12	21 3	20 53	20 48	20 41	20 33	20 24	20 20	20 15	20 10	20 4
	3	22 7	22 1	21 56	21 49	21 45	21 41	21 36	21 30	21 27	21 24	21 21	21 17
	4	22 51	22 49	22 46	22 43	22 41	22 39	22 37	22 34	22 33	22 32	22 30	22 28
	5	23 34	23 35	23 35	23 36	23 36	23 36	23 37	23 37	23 37	23 37	23 37	23 38
	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	7	0 17	0 20	0 24	0 28	0 30	0 32	0 35	0 39	0 41	0 42	0 44	0 46
	8	1 0	1 6	1 12	1 19	1 24	1 28	1 34	1 40	1 43	1 47	1 50	1 55
	9	1 44	1 52	2 1	2 11	2 17	2 24	2 32	2 41	2 46	2 51	2 56	3 2
	10	2 29	2 39	2 51	3 4	3 11	3 20	3 30	3 42	3 48	3 54	4 1	4 9
	11	3 16	3 28	3 42	3 57	4 6	4 16	4 27	4 42	4 49	4 56	5 4	5 14
	12	4 5	4 18	4 33	4 50	4 59	5 11	5 24	5 39	5 47	5 55	6 4	6 15
	13	4 56	5 10	5 25	5 42	5 52	6 3	6 17	6 34	6 41	6 50	6 59	7 10
	14	5 48	6 2	6 16	6 33	6 43	6 54	7 7	7 23	7 30	7 38	7 48	7 58
	15	6 41	6 53	7 6	7 22	7 31	7 41	7 52	8 6	8 13	8 20	8 28	8 38
	16	7 33	7 44	7 55	8 8	8 15	8 24	8 33	8 45	8 50	8 56	9 3	9 10
	17	8 25	8 34	8 42	8 52	8 57	9 3	9 10	9 19	9 23	9 27	9 32	9 38
	18	9 17	9 22	9 27	9 33	9 37	9 40	9 45	9 50	9 53	9 55	9 58	10 1
	19	10 8	10 10	10 12	10 14	10 15	10 16	10 18	10 19	10 20	10 21	10 22	10 23
	20	10 59	10 58	10 56	10 54	10 53	10 51	10 50	10 48	10 47	10 46	10 45	10 44
	21	11 51	11 46	11 41	11 35	11 31	11 27	11 23	11 17	11 16	11 12	11 9	11 6
	22	12 44	12 36	12 28	12 18	12 12	12 6	11 58	11 50	11 45	11 41	11 36	11 30
	23	13 39	13 28	13 17	13 4	12 56	12 48	12 37	12 25	12 20	12 14	12 7	11 59
	24	14 35	14 23	14 9	13 53	13 44	13 34	13 22	13 7	13 0	12 53	12 44	12 34
	25	15 32	15 18	15 4	14 46	14 36	14 25	14 12	13 55	13 48	13 39	13 30	13 19
	26	16 30	16 15	16 0	15 43	15 33	15 21	15 8	14 51	14 43	14 34	14 25	14 14
	27	17 25	17 12	16 58	16 42	16 32	16 21	16 8	15 53	15 45	15 37	15 28	15 18
	28	18 19	18 8	17 55	17 41	17 32	17 23	17 12	16 58	16 52	16 45	16 37	16 28
	29	19 10	19 1	18 51	18 40	18 33	18 25	18 16	18 6	18 1	17 55	17 49	17 42
	30	19 59	19 52	19 45	19 37	19 32	19 27	19 20	19 12	19 9	19 5	19 1	18 56
	31	20 45	20 41	20 37	20 32	20 29	20 26	20 22	20 18	20 16	20 14	20 12	20 9
Aug.	1	21 29	21 28	21 27	21 26	21 25	21 24	21 23	21 22	21 22	21 21	21 20	21 20
	2	22 12	22 14	22 16	22 18	22 20	22 21	22 23	22 25	22 26	22 27	22 28	22 30
	3	22 55	23 0	23 5	23 10	23 14	23 17	23 22	23 27	23 29	23 32	23 35	23 38
	4	23 38	23 45	23 53	.....	.....	.....	.....	.....	.....	.....	.....	.....
	5	.....	.....	.....	0 2	0 7	0 13	0 20	0 28	0 32	0 36	0 41	0 46
	6	0 22	0 32	0 42	0 54	1 1	1 9	1 18	1 29	1 34	1 40	1 46	1 53
	7	1 8	1 20	1 32	1 46	1 55	2 4	2 15	2 29	2 35	2 42	2 50	2 58
	8	1 56	2 9	2 23	2 39	2 48	2 59	3 12	3 27	3 34	3 42	3 51	4 1
	9	2 46	3 0	3 14	3 31	3 41	3 53	4 6	4 22	4 30	4 38	4 48	4 59
	10	3 37	3 51	4 6	4 23	4 33	4 44	4 58	5 14	5 21	5 30	5 39	5 50
	11	4 30	4 43	4 57	5 13	5 22	5 33	5 45	6 0	6 7	6 15	6 24	6 34
	12	5 23	5 35	5 47	6 1	6 9	6 18	6 29	6 42	6 48	6 54	7 2	7 10
	13	6 17	6 26	6 36	6 47	6 53	7 0	7 8	7 18	7 23	7 28	7 34	7 40
	14	7 10	7 16	7 23	7 30	7 34	7 39	7 45	7 51	7 54	7 58	8 1	8 5
	15	8 3	8 6	8 9	8 12	8 14	8 16	8 19	8 22	8 24	8 25	8 26	8 28
	16	8 55	8 55	8 54	8 53	8 53	8 53	8 52	8 52	8 51	8 51	8 50	8 50
	17	9 48	9 44	9 40	9 35	9 32	9 29	9 26	9 21	9 19	9 17	9 15	9 12

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.
For other longitudes and for southern latitudes see page 744.

Lat. Data.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	22 16	22 21	22 27	22 34	22 38	22 43	22 48	22 54	22 57	23 0	23 4	23 8	23 13
17	23 9	23 18	23 27	23 38	23 44	23 51	23 59	.....	.....	.....	.....	.....	.....
18	.....	.....	.....	.....	.....	.....	.....	0 9	0 14	0 19	0 25	0 31	0 38
19	0 4	0 15	0 27	0 41	0 49	0 58	1 9	1 22	1 28	1 35	1 42	1 51	2 1
20	1 0	1 13	1 27	1 43	1 52	2 3	2 15	2 31	2 38	2 46	2 55	3 5	3 17
21	1 56	2 10	2 25	2 42	2 52	3 3	3 17	3 33	3 41	3 50	4 0	4 10	4 23
22	2 51	3 5	3 20	3 37	3 47	3 59	4 12	4 28	4 36	4 45	4 55	5 5	5 18
23	3 46	3 59	4 13	4 29	4 38	4 48	5 0	5 16	5 23	5 30	5 39	5 49	6 0
24	4 38	4 49	5 1	5 15	5 23	5 32	5 43	5 56	6 2	6 8	6 16	6 24	6 33
25	5 28	5 37	5 47	5 58	6 4	6 11	6 20	6 30	6 34	6 39	6 45	6 51	6 58
26	6 16	6 22	6 29	6 37	6 41	6 47	6 52	6 59	7 3	7 6	7 10	7 14	7 19
27	7 2	7 5	7 9	7 13	7 16	7 19	7 22	7 26	7 28	7 30	7 32	7 34	7 37
28	7 46	7 46	7 47	7 48	7 49	7 49	7 50	7 51	7 51	7 52	7 52	7 53	7 53
29	8 29	8 27	8 25	8 22	8 21	8 19	8 17	8 15	8 14	8 13	8 12	8 10	8 8
30	9 12	9 7	9 2	8 56	8 53	8 49	8 45	8 40	8 37	8 34	8 31	8 28	8 24
Sept. 31	9 55	9 48	9 40	9 31	9 26	9 20	9 13	9 5	9 1	8 57	8 53	8 48	8 42
1	10 40	10 30	10 20	10 8	10 1	9 53	9 44	9 33	9 28	9 23	9 17	9 10	9 2
2	11 25	11 13	11 1	10 47	10 39	10 29	10 18	10 5	9 59	9 52	9 45	9 36	9 27
3	12 12	11 59	11 45	11 29	11 20	11 10	10 57	10 42	10 35	10 27	10 19	10 9	9 58
4	13 2	12 48	12 33	12 16	12 6	11 55	11 41	11 26	11 18	11 10	11 0	10 50	10 37
5	13 52	13 38	13 23	13 6	12 57	12 45	12 32	12 16	12 8	12 0	11 50	11 39	11 27
6	14 44	14 31	14 17	14 1	13 52	13 41	13 29	13 14	13 6	12 58	12 50	12 40	12 28
7	15 38	15 26	15 14	15 0	14 52	14 42	14 32	14 18	14 12	14 5	13 58	13 49	13 39
8	16 31	16 22	16 12	16 1	15 55	15 48	15 39	15 29	15 24	15 19	15 13	15 6	14 59
9	17 25	17 19	17 12	17 5	17 1	16 56	16 50	16 43	16 40	16 37	16 33	16 28	16 24
10	18 19	18 16	18 13	18 10	18 8	18 6	18 3	18 0	17 59	17 57	17 56	17 54	17 52
11	19 13	19 14	19 14	19 15	19 16	19 17	19 18	19 18	19 19	19 19	19 20	19 21	19 21
12	20 8	20 12	20 17	20 22	20 25	20 29	20 33	20 38	20 40	20 42	20 45	20 48	20 52
13	21 3	21 10	21 18	21 28	21 33	21 39	21 47	21 55	21 59	22 4	22 9	22 14	22 21
14	21 59	22 9	22 20	22 33	22 40	22 49	22 59	23 11	23 17	23 23	23 30	23 38	23 47
15	22 55	23 8	23 21	23 36	23 46	23 56	.....	.....	.....	.....	.....	.....	.....
16	23 52	.....	.....	.....	.....	.....	0 8	0 22	0 29	0 37	0 46	0 56	1 7
17	.....	0 5	0 20	0 37	0 47	0 58	1 11	1 28	1 35	1 44	1 53	2 4	2 17
18	0 47	1 1	1 16	1 34	1 44	1 55	2 9	2 25	2 33	2 42	2 51	3 2	3 15
19	1 42	1 55	2 9	2 26	2 35	2 46	2 59	3 14	3 22	3 30	3 39	3 49	4 1
20	2 34	2 46	2 59	3 13	3 22	3 31	3 42	3 56	4 2	4 9	4 17	4 26	4 36
21	3 24	3 34	3 44	3 56	4 3	4 11	4 20	4 31	4 36	4 42	4 48	4 55	5 3
22	4 12	4 19	4 27	4 36	4 41	4 47	4 54	5 2	5 5	5 10	5 14	5 19	5 25
23	4 58	5 2	5 7	5 13	5 16	5 20	5 24	5 29	5 31	5 34	5 36	5 39	5 43
24	5 42	5 44	5 46	5 48	5 49	5 50	5 52	5 54	5 55	5 56	5 57	5 58	5 59
25	6 25	6 24	6 23	6 22	6 21	6 20	6 19	6 18	6 18	6 17	6 16	6 16	6 15
26	7 8	7 4	7 0	6 55	6 53	6 50	6 46	6 42	6 40	6 38	6 36	6 33	6 31
27	7 52	7 45	7 38	7 30	7 25	7 20	7 14	7 7	7 4	7 0	6 57	6 52	6 47
28	8 35	8 26	8 17	8 6	8 0	7 53	7 44	7 34	7 30	7 25	7 19	7 13	7 6
29	9 20	9 9	8 57	8 44	8 36	8 27	8 17	8 5	7 59	7 53	7 46	7 38	7 29
30	10 6	9 54	9 40	9 25	9 16	9 6	8 54	8 39	8 33	8 25	8 17	8 8	7 57
Oct. 1	10 54	10 40	10 26	10 9	9 59	9 48	9 35	9 19	9 12	9 4	8 54	8 44	8 32
2	11 43	11 29	11 14	10 57	10 47	10 35	10 22	10 6	9 58	9 49	9 40	9 29	9 16

TABLE X.

739

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Data.													
Aug. 16	h m 9 48	h m 9 44	h m 9 40	h m 9 35	h m 9 32	h m 9 29	h m 9 26	h m 9 21	h m 9 19	h m 9 17	h m 9 15	h m 9 12	h m 9 9
17	10 41	10 34	10 26	10 18	10 13	10 7	10 0	9 53	9 49	9 45	9 41	9 36	9 31
18	11 35	11 25	11 15	11 3	10 56	10 48	10 39	10 28	10 22	10 17	10 11	10 4	9 56
19	12 31	12 18	12 5	11 51	11 42	11 32	11 21	11 7	11 0	10 53	10 46	10 36	10 26
20	13 26	13 13	12 58	12 42	12 32	12 21	12 8	11 52	11 45	11 37	11 28	11 17	11 5
21	14 22	14 8	13 53	13 36	13 26	13 14	13 1	12 44	12 36	12 28	12 18	12 7	11 54
22	15 18	15 4	14 50	14 33	14 23	14 12	13 59	13 42	13 35	13 26	13 17	13 7	12 54
23	16 11	15 59	15 46	15 31	15 22	15 12	15 0	14 45	14 39	14 31	14 23	14 13	14 3
24	17 2	16 52	16 41	16 29	16 21	16 13	16 3	15 51	15 46	15 40	15 33	15 25	15 16
25	17 51	17 44	17 35	17 26	17 20	17 14	17 6	16 57	16 53	16 49	16 42	16 38	16 31
26	18 38	18 33	18 28	18 22	18 18	18 14	18 9	18 3	18 1	17 58	17 54	17 51	17 47
27	19 23	19 21	19 19	19 16	19 14	19 13	19 10	19 8	19 7	19 6	19 4	19 3	19 1
28	20 7	20 8	20 8	20 9	20 10	20 10	20 11	20 12	20 12	20 12	20 13	20 13	20 14
29	20 50	20 54	20 57	21 2	21 4	21 7	21 10	21 14	21 16	21 18	21 20	21 23	21 25
30	21 33	21 39	21 46	21 54	21 58	22 3	22 9	22 16	22 19	22 23	22 27	22 31	22 36
Sept. 31	22 17	22 26	22 35	22 45	22 52	22 58	23 7	23 16	23 21	23 26	23 32	23 38	23 45
1	23 2	23 12	23 24	23 37	23 45	23 54	0 4	0 16	0 22	0 28	0 36	0 44	0 53
2	23 48	0 0	0 14	0 29	0 38	0 48	1 0	1 14	1 21	1 29	1 37	1 47	1 58
3	0 36	0 49	1 4	1 21	1 30	1 41	1 54	2 10	2 18	2 26	2 36	2 46	2 58
4	1 26	1 40	1 55	2 12	2 22	2 33	2 46	3 3	3 10	3 19	3 29	3 39	3 52
5	2 17	2 31	2 45	3 2	3 12	3 23	3 35	3 51	3 58	4 7	4 16	4 26	4 38
6	3 10	3 22	3 35	3 50	3 59	4 9	4 20	4 34	4 41	4 48	4 56	5 5	5 15
7	4 3	4 14	4 25	4 37	4 44	4 52	5 2	5 13	5 18	5 24	5 31	5 38	5 46
8	4 57	5 5	5 13	5 22	5 27	5 33	5 40	5 48	5 52	5 56	6 1	6 5	6 11
9	5 51	5 55	6 0	6 5	6 8	6 12	6 16	6 20	6 22	6 25	6 27	6 30	6 33
10	6 45	6 46	6 47	6 48	6 48	6 49	6 50	6 51	6 52	6 52	6 53	6 53	6 54
11	7 39	7 36	7 34	7 30	7 29	7 27	7 24	7 22	7 20	7 19	7 17	7 16	7 14
12	8 34	8 28	8 21	8 14	8 10	8 5	8 0	7 53	7 50	7 47	7 44	7 39	7 35
13	9 29	9 20	9 10	9 0	8 53	8 46	8 38	8 28	8 23	8 18	8 12	8 6	7 59
14	10 25	10 14	10 2	9 48	9 39	9 30	9 19	9 6	9 0	8 54	8 46	8 38	8 28
15	11 22	11 9	10 55	10 38	10 29	10 18	10 6	9 50	9 43	9 35	9 26	9 16	9 5
16	12 18	12 4	11 49	11 32	11 22	11 11	10 57	10 41	10 33	10 24	10 15	10 4	9 51
17	13 14	13 0	12 45	12 28	12 18	12 7	11 53	11 37	11 29	11 21	11 11	11 0	10 48
18	14 17	13 54	13 41	13 25	13 16	13 5	12 53	12 38	12 31	12 23	12 14	12 4	11 53
19	14 58	14 47	14 36	14 22	14 14	14 5	13 55	13 42	13 36	13 29	13 22	13 14	13 4
20	15 47	15 38	15 29	15 18	15 12	15 5	14 57	14 47	14 42	14 37	14 32	14 26	14 18
21	16 34	16 28	16 22	16 14	16 10	16 5	15 59	15 52	15 49	15 46	15 42	15 37	15 33
22	17 19	17 16	17 12	17 8	17 6	17 4	17 0	16 57	16 55	16 53	16 51	16 49	16 46
23	18 13	18 3	18 2	18 2	18 2	18 1	18 1	18 0	18 0	18 0	18 0	18 0	17 59
24	18 46	18 49	18 51	18 54	18 56	18 58	19 0	19 3	19 4	19 6	19 8	19 9	19 11
25	19 29	19 34	19 40	19 47	19 50	19 54	19 59	20 5	20 8	20 11	20 14	20 18	20 22
26	20 13	20 20	20 29	20 39	20 44	20 50	20 58	21 7	21 11	21 15	21 20	21 26	21 32
27	20 57	21 7	21 18	21 30	21 37	21 46	21 55	22 6	22 12	22 18	22 25	22 32	22 40
28	21 42	21 54	22 7	22 22	22 30	22 40	22 52	23 5	23 12	23 19	23 27	23 36	23 46
29	22 29	22 43	22 57	23 13	23 22	23 33	23 46	0 1	0 9	0 17	0 26	0 36	0 48
Oct. 1	23 18	23 32	23 46	0 4	0 14	0 25	0 38	0 54	1 2	1 11	1 20	1 31	1 44
2	0 36	0 49	1 4	1 21	1 30	1 41	1 54	2 10	2 18	2 26	2 36	2 46	2 58

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours;
if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one
to the day.

To obtain standard time, see directions on page 710.
For other longitudes and for southern latitudes see page 744.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct.	1	h m 10 54	h m 10 40	h m 10 26	h m 10 9	h m 9 59	h m 9 48	h m 9 35	h m 9 19	h m 9 12	h m 9 4	h m 8 54	h m 8 44	h m 8 32
	2	11 43	11 29	11 14	10 57	10 47	10 35	10 22	10 6	9 58	9 49	9 40	9 29	9 16
	3	12 33	12 20	12 5	11 49	11 39	11 28	11 15	10 59	10 51	10 43	10 34	10 23	10 11
	4	13 25	13 12	12 59	12 44	12 35	12 25	12 13	11 59	11 52	11 45	11 36	11 27	11 16
	5	14 17	14 6	13 55	13 43	13 35	13 27	13 17	13 5	13 0	12 54	12 47	12 39	12 30
	6	15 10	15 2	14 54	14 44	14 39	14 32	14 25	14 16	14 12	14 8	14 3	13 58	13 51
	7	16 3	15 58	15 54	15 48	15 45	15 41	15 37	15 32	15 30	15 27	15 24	15 21	15 18
	8	16 57	16 56	16 55	16 54	16 53	16 52	16 51	16 50	16 50	16 49	16 48	16 47	16 47
	9	17 52	17 55	17 58	18 1	18 3	18 5	18 7	18 10	18 11	18 13	18 15	18 17	18 19
	10	18 48	18 54	19 1	19 9	19 13	19 18	19 24	19 31	19 34	19 38	19 42	19 46	19 51
	11	19 46	19 55	20 5	20 17	20 23	20 31	20 40	20 51	20 56	21 1	21 8	21 14	21 22
	12	20 44	20 56	21 9	21 24	21 32	21 42	21 53	22 7	22 14	22 21	22 29	22 38	22 49
	13	21 43	21 57	22 11	22 28	22 38	22 49	23 2	23 18	23 25	23 34	23 43	23 54	...
	14	22 41	22 55	23 10	23 28	23 38	23 50	...	...	...	...	...	...	0 6
	15	23 37	23 51	...	...	...	...	0 4	0 20	0 28	0 37	0 47	0 58	1 11
	16	...	...	0 6	0 23	0 33	0 44	0 57	1 13	1 21	1 29	1 38	1 49	2 1
	17	0 31	0 44	0 57	1 12	1 21	1 31	1 43	1 57	2 4	2 11	2 20	2 29	2 40
	18	1 22	1 32	1 44	1 57	2 4	2 13	2 22	2 34	2 40	2 46	2 53	3 0	3 9
	19	2 10	2 18	2 27	2 37	2 43	2 49	2 57	3 6	3 10	3 15	3 20	3 25	3 32
	20	2 56	3 2	3 8	3 14	3 18	3 22	3 27	3 33	3 36	3 39	3 43	3 46	3 50
	21	3 40	3 43	3 46	3 49	3 51	3 53	3 56	3 59	4 0	4 2	4 3	4 5	4 7
	22	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 23	4 22	4 22	4 22	4 22
	23	5 6	5 3	5 0	4 56	4 54	4 52	4 49	4 46	4 45	4 43	4 41	4 39	4 37
	24	5 49	5 43	5 37	5 30	5 27	5 22	5 17	5 11	5 8	5 5	5 2	4 58	4 54
	25	6 33	6 24	6 16	6 6	6 0	5 54	5 46	5 37	5 33	5 28	5 23	5 18	5 11
	26	7 17	7 7	6 56	6 43	6 35	6 27	6 17	6 6	6 1	5 55	5 48	5 41	5 32
	27	8 2	7 51	7 37	7 22	7 14	7 4	6 52	6 39	6 32	6 25	6 17	6 8	5 58
	28	8 50	8 36	8 22	8 5	7 56	7 45	7 32	7 16	7 9	7 1	6 52	6 42	6 30
	29	9 38	9 24	9 9	8 51	8 41	8 30	8 16	8 0	7 52	7 44	7 34	7 23	7 10
	30	10 27	10 13	9 58	9 41	9 31	9 20	9 6	8 50	8 42	8 33	8 24	8 13	8 0
Nov.	31	11 17	11 4	10 50	10 34	10 24	10 14	10 1	9 46	9 39	9 31	9 22	9 12	9 0
	1	12 7	11 56	11 44	11 30	11 21	11 12	11 1	10 48	10 42	10 35	10 28	10 19	10 9
	2	12 58	12 49	12 39	12 28	12 22	12 14	12 6	11 55	11 50	11 45	11 39	11 33	11 25
	3	13 49	13 43	13 36	13 28	13 24	13 19	13 13	13 6	13 3	13 0	12 56	12 51	12 46
	4	14 41	14 38	14 35	14 32	14 29	14 27	14 24	14 21	14 20	14 18	14 16	14 14	14 12
	5	15 34	15 35	15 36	15 36	15 37	15 37	15 38	15 38	15 39	15 39	15 40	15 40	15 41
	6	16 30	16 34	16 38	16 43	16 46	16 50	16 54	16 59	17 1	17 3	17 6	17 9	17 12
	7	17 27	17 34	17 42	17 52	17 58	18 4	18 11	18 20	18 24	18 29	18 34	18 39	18 46
	8	18 26	18 36	18 48	19 1	19 9	19 18	19 28	19 40	19 46	19 53	20 0	20 8	20 17
	9	19 26	19 39	19 53	20 9	20 18	20 29	20 42	20 57	21 4	21 12	21 21	21 31	21 43
	10	20 27	20 41	20 56	21 14	21 24	21 36	21 50	22 6	22 14	22 23	22 33	22 44	22 57
	11	21 26	21 41	21 56	22 14	22 24	22 35	22 49	23 6	23 14	23 23	23 33	23 44	23 57
	12	22 23	22 37	22 51	23 7	23 17	23 27	23 40	23 55	...	...	...	...	...
	13	23 17	23 28	23 41	23 55	...	...	...	...	0 2	0 11	0 19	0 30	0 41
	14	...	...	...	...	0 3	0 12	0 23	0 36	0 42	0 49	0 56	1 5	1 14
	15	0 7	0 16	0 26	0 37	0 44	0 51	1 0	1 10	1 15	1 20	1 26	1 32	1 39
	16	0 54	1 1	1 8	1 16	1 20	1 26	1 32	1 39	1 42	1 46	1 50	1 54	1 59

TABLE X.

741

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
Oct. 1	h m 23 18	h m 23 32	h m 23 46	h m	h m	h m	h m	h m 0 1	h m 0 9	h m 0 17	h m 0 26	h m 0 36	h m 0 48
2	0 7	0 21	0 36	0 4	0 14	0 25	0 38	0 54	1 2	1 11	1 20	1 31	1 44
3	0 7	0 21	0 36	0 53	1 3	1 14	1 27	1 43	1 51	2 0	2 9	2 20	2 32
4	0 58	1 11	1 25	1 41	1 50	2 0	2 13	2 28	2 35	2 42	2 51	3 1	3 12
5	1 50	2 1	2 13	2 27	2 35	2 44	2 55	3 8	3 13	3 20	3 27	3 35	3 44
6	2 42	2 51	3 1	3 12	3 18	3 25	3 33	3 43	3 48	3 53	3 58	4 4	4 11
7	3 35	3 41	3 48	3 55	3 59	4 4	4 10	4 16	4 19	4 22	4 26	4 30	4 34
8	4 28	4 31	4 34	4 38	4 40	4 42	4 44	4 47	4 48	4 50	4 52	4 53	4 55
9	5 23	5 22	5 21	5 20	5 20	5 19	5 18	5 18	5 17	5 17	5 16	5 16	5 15
10	6 18	6 14	6 10	6 4	6 1	5 58	5 54	5 49	5 47	5 44	5 42	5 39	5 36
11	7 16	7 8	7 0	6 50	6 45	6 39	6 32	6 23	6 19	6 15	6 10	6 5	5 59
12	8 14	8 3	7 52	7 39	7 31	7 23	7 13	7 1	6 55	6 49	6 43	6 35	6 26
13	9 12	9 0	8 46	8 30	8 21	8 11	7 59	7 44	7 38	7 30	7 21	7 12	7 1
14	10 11	9 57	9 42	9 25	9 15	9 4	8 50	8 34	8 26	8 18	8 8	7 57	7 45
15	11 8	10 54	10 39	10 22	10 11	10 0	9 46	9 30	9 22	9 13	9 3	8 52	8 39
16	12 3	11 50	11 36	11 19	11 10	10 59	10 46	10 30	10 23	10 15	10 6	9 55	9 43
17	12 56	12 44	12 32	12 17	12 9	11 59	11 48	11 34	11 28	11 21	11 13	11 4	10 54
18	13 45	13 36	13 26	13 14	13 7	12 59	12 50	12 39	12 34	12 29	12 22	12 15	12 7
19	14 32	14 25	14 18	14 10	14 4	13 59	13 52	13 44	13 41	13 36	13 32	13 27	13 21
20	15 18	15 13	15 9	15 4	15 1	14 57	14 53	14 48	14 46	14 44	14 41	14 38	14 35
21	16 1	16 0	15 58	15 57	15 56	15 55	15 54	15 52	15 51	15 51	15 50	15 49	15 48
22	16 44	16 46	16 47	16 49	16 50	16 52	16 53	16 55	16 55	16 56	16 58	16 58	17 0
23	17 27	17 31	17 36	17 41	17 44	17 48	17 52	17 57	17 59	18 2	18 4	18 7	18 11
24	18 10	18 17	18 25	18 33	18 38	18 44	18 50	18 58	19 2	19 6	19 10	19 15	19 21
25	18 54	19 4	19 14	19 25	19 32	19 39	19 48	19 59	20 4	20 10	20 16	20 22	20 30
26	19 39	19 51	20 3	20 17	20 25	20 34	20 45	20 58	21 5	21 12	21 19	21 28	21 38
27	20 26	20 39	20 52	21 8	21 18	21 28	21 41	21 56	22 3	22 11	22 20	22 30	22 41
28	21 13	21 27	21 42	21 59	22 9	22 20	22 34	22 50	22 58	23 6	23 16	23 27	23 39
29	22 2	22 16	22 31	22 48	22 58	23 10	23 23	23 40	23 48	23 56	.....	.....	.....
30	22 51	23 5	23 19	23 36	23 45	23 56	.....	.....	.....	.....	0 6	0 17	0 30
Nov. 1	23 41	23 53	.....	.....	.....	.....	0 9	0 25	0 32	0 41	0 50	1 0	1 12
2	0 32	0 42	0 53	1 5	1 12	1 21	1 30	1 41	1 46	1 52	1 59	2 6	2 14
3	1 22	1 30	1 38	1 47	1 53	1 59	2 6	2 14	2 18	2 22	2 27	2 32	2 38
4	2 14	2 18	2 23	2 29	2 32	2 36	2 40	2 44	2 47	2 49	2 52	2 55	2 58
5	3 6	3 7	3 9	3 10	3 11	3 12	3 13	3 14	3 15	3 15	3 16	3 16	3 17
6	4 0	3 58	3 55	3 52	3 51	3 49	3 47	3 44	3 43	3 42	3 40	3 38	3 37
7	4 56	4 50	4 44	4 37	4 33	4 28	4 22	4 16	4 13	4 10	4 6	4 2	3 58
8	5 54	5 45	5 35	5 24	5 18	5 10	5 2	4 52	4 47	4 42	4 36	4 30	4 22
9	6 54	6 43	6 30	6 15	6 7	5 57	5 46	5 32	5 26	5 19	5 11	5 3	4 53
10	7 55	7 42	7 27	7 10	7 0	6 49	6 36	6 20	6 13	6 4	5 55	5 45	5 33
11	8 56	8 41	8 26	8 8	7 57	7 46	7 32	7 15	7 7	6 58	6 48	6 37	6 24
12	9 54	9 40	9 25	9 8	8 58	8 46	8 33	8 16	8 9	8 0	7 50	7 39	7 26
13	10 49	10 37	10 23	10 8	9 59	9 49	9 36	9 22	9 15	9 7	8 58	8 49	8 37
14	11 41	11 31	11 20	11 7	10 59	10 51	10 40	10 28	10 23	10 16	10 9	10 2	9 52
15	12 30	12 22	12 14	12 4	11 58	11 52	11 44	11 35	11 30	11 26	11 21	11 15	11 8
16	13 16	13 11	13 5	12 59	12 55	12 51	12 46	12 40	12 37	12 34	12 31	12 27	12 23

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

<div><div>Lat.</div><div>Date.</div></div>	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>	<div>h m</div>
Nov. 16	0 54	1 1	1 8	1 16	1 20	1 26	1 32	1 39	1 42	1 46	1 50	1 54	1 59
17	1 39	1 43	1 47	1 52	1 54	1 57	2 0	2 5	2 6	2 8	2 11	2 13	2 16
18	2 22	2 23	2 24	2 26	2 26	2 27	2 28	2 29	2 29	2 30	2 30	2 31	2 31
19	3 5	3 3	3 1	2 58	2 57	2 56	2 54	2 52	2 51	2 50	2 49	2 48	2 46
20	3 48	3 43	3 38	3 32	3 29	3 25	3 21	3 16	3 13	3 11	3 8	3 5	3 1
21	4 31	4 23	4 16	4 6	4 1	3 56	3 49	3 41	3 37	3 33	3 29	3 24	3 18
22	5 15	5 5	4 55	4 43	4 36	4 28	4 19	4 8	4 3	3 58	3 52	3 45	3 37
23	6 0	5 48	5 36	5 21	5 13	5 4	4 53	4 40	4 33	4 27	4 19	4 10	4 1
24	6 47	6 34	6 20	6 3	5 54	5 43	5 31	5 15	5 8	5 0	4 52	4 42	4 30
25	7 35	7 21	7 6	6 49	6 38	6 27	6 13	5 57	5 49	5 41	5 31	5 20	5 8
26	8 24	8 10	7 54	7 37	7 27	7 15	7 1	6 45	6 37	6 28	6 18	6 7	5 54
27	9 14	9 0	8 45	8 28	8 19	8 8	7 55	7 38	7 31	7 23	7 14	7 3	6 50
28	10 3	9 51	9 38	9 23	9 14	9 4	8 52	8 38	8 32	8 24	8 16	8 7	7 56
29	10 53	10 42	10 32	10 19	10 12	10 4	9 54	9 42	9 37	9 31	9 24	9 17	9 8
30	11 42	11 35	11 26	11 17	11 12	11 6	10 59	10 50	10 46	10 42	10 37	10 32	10 26
Dec. 1	12 32	12 28	12 23	12 17	12 14	12 10	12 6	12 1	11 59	11 56	11 53	11 50	11 47
2	13 22	13 21	13 20	13 19	13 18	13 17	13 16	13 14	13 14	13 13	13 13	13 12	13 11
3	14 14	14 17	14 19	14 22	14 24	14 26	14 28	14 30	14 32	14 33	14 35	14 36	14 38
4	15 9	15 14	15 21	15 28	15 32	15 37	15 42	15 49	15 52	15 56	15 59	16 3	16 8
5	16 5	16 14	16 24	16 35	16 42	16 49	16 58	17 9	17 14	17 19	17 25	17 32	17 40
6	17 5	17 16	17 29	17 44	17 52	18 2	18 14	18 27	18 34	18 41	18 49	18 59	19 9
7	18 6	18 20	18 34	18 51	19 1	19 12	19 26	19 42	19 50	19 58	20 8	20 19	20 32
8	19 7	19 22	19 37	19 55	20 6	20 18	20 32	20 49	20 57	21 6	21 16	21 28	21 41
9	20 8	20 22	20 37	20 54	21 4	21 15	21 29	21 46	21 53	22 2	22 12	22 23	22 35
10	21 5	21 17	21 31	21 46	21 55	22 6	22 18	22 32	22 39	22 46	22 55	23 4	23 15
11	21 58	22 9	22 20	22 33	22 40	22 49	22 58	23 10	23 16	23 22	23 28	23 36	23 44
12	22 48	22 56	23 5	23 14	23 20	23 26	23 33	23 42	23 46	23 50	23 55	...	...
13	23 35	23 40	23 46	23 52	23 55	...	...	...	...	...	...	0 1	0 7
14	...	...	...	...	...	0 0	0 4	0 9	0 12	0 15	0 18	0 21	0 25
15	0 20	0 22	0 24	0 27	0 28	0 30	0 32	0 34	0 35	0 36	0 38	0 39	0 41
16	1 3	1 2	1 1	1 0	1 0	0 59	0 59	0 58	0 57	0 57	0 56	0 56	0 55
17	1 46	1 42	1 38	1 34	1 31	1 28	1 25	1 21	1 19	1 17	1 15	1 13	1 10
18	2 28	2 22	2 15	2 8	2 3	1 58	1 52	1 46	1 42	1 39	1 35	1 31	1 26
19	3 12	3 3	2 54	2 43	2 37	2 30	2 22	2 12	2 7	2 2	1 57	1 51	1 44
20	3 57	3 46	3 34	3 20	3 13	3 4	2 54	2 41	2 36	2 29	2 22	2 14	2 5
21	4 43	4 30	4 17	4 1	3 52	3 42	3 30	3 15	3 8	3 1	2 52	2 43	2 32
22	5 31	5 17	5 2	4 45	4 35	4 24	4 11	3 55	3 47	3 38	3 29	3 18	3 6
23	6 20	6 6	5 51	5 33	5 23	5 11	4 57	4 40	4 33	4 24	4 14	4 2	3 49
24	7 10	6 56	6 41	6 24	6 14	6 3	5 49	5 33	5 25	5 16	5 7	4 56	4 43
25	8 1	7 48	7 34	7 18	7 9	6 58	6 46	6 31	6 24	6 16	6 8	5 58	5 46
26	8 51	8 40	8 28	8 14	8 6	7 57	7 47	7 34	7 28	7 22	7 14	7 6	6 57
27	9 40	9 32	9 22	9 12	9 6	8 59	8 51	8 41	8 36	8 31	8 26	8 20	8 13
28	10 29	10 23	10 17	10 10	10 6	10 2	9 56	9 50	9 47	9 44	9 40	9 36	9 32
29	11 18	11 16	11 13	11 10	11 8	11 6	11 4	11 1	11 0	10 59	10 57	10 55	10 53
30	12 8	12 9	12 10	12 11	12 12	12 12	12 13	12 14	12 15	12 15	12 16	12 16	12 17
31	12 59	13 4	13 8	13 13	13 16	13 20	13 24	13 29	13 31	13 33	13 36	13 39	13 43
32	13 52	14 0	14 8	14 18	14 23	14 29	14 36	14 45	14 49	14 54	14 59	15 4	15 10

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB),
MERIDIAN OF GREENWICH, 1923.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 710.

For other longitudes and for southern latitudes see page 744.

Lat. Date.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	13 16	13 11	13 5	12 59	12 55	12 51	12 46	12 40	12 37	12 34	12 31	12 27	12 23
17	14 0	13 58	13 55	13 52	13 51	13 49	13 47	13 44	13 43	13 41	13 40	13 38	13 36
18	14 43	14 44	14 44	14 45	14 45	14 46	14 46	14 47	14 47	14 47	14 48	14 48	14 48
19	15 26	15 29	15 33	15 37	15 39	15 42	15 45	15 49	15 51	15 53	15 55	15 57	16 0
20	16 8	16 15	16 21	16 29	16 33	16 38	16 44	16 51	16 53	16 57	17 1	17 6	17 10
21	16 52	17 1	17 10	17 21	17 27	17 34	17 42	17 52	17 56	18 1	18 7	18 13	18 20
22	17 37	17 48	17 59	18 13	18 20	18 29	18 40	18 52	18 58	19 4	19 12	19 20	19 29
23	18 23	18 36	18 49	19 5	19 14	19 24	19 36	19 51	19 58	20 5	20 14	20 24	20 35
24	19 10	19 24	19 39	19 56	20 6	20 17	20 30	20 47	20 54	21 3	21 12	21 23	21 36
25	19 59	20 13	20 28	20 46	20 56	21 8	21 22	21 38	21 46	21 55	22 5	22 16	22 29
26	20 48	21 2	21 17	21 34	21 44	21 56	22 9	22 25	22 33	22 41	22 51	23 2	23 14
27	21 38	21 51	22 4	22 20	22 29	22 40	22 52	23 7	23 14	23 22	23 30	23 40	23 51
28	22 27	22 38	22 50	23 4	23 12	23 21	23 31	23 44	23 50	23 56	...	...	...
29	23 16	23 25	23 35	23 45	23 52	23 59	...	...	...	...	0 3	0 11	0 20
30	...	...	...	...	...	...	0 7	0 17	0 21	0 26	0 31	0 38	0 44
Dec. 1	0 6	0 12	0 19	0 26	0 30	0 35	0 40	0 46	0 50	0 53	0 56	1 0	1 5
2	0 56	0 59	1 2	1 5	1 7	1 9	1 12	1 15	1 16	1 18	1 19	1 21	1 23
3	1 47	1 46	1 46	1 45	1 45	1 44	1 44	1 43	1 43	1 42	1 42	1 42	1 41
4	2 40	2 36	2 32	2 26	2 24	2 21	2 17	2 12	2 10	2 8	2 6	2 3	2 0
5	3 35	3 28	3 20	3 10	3 5	3 0	2 53	2 45	2 41	2 37	2 32	2 27	2 22
6	4 33	4 23	4 11	3 59	3 51	3 43	3 33	3 21	3 16	3 10	3 3	2 56	2 47
7	5 34	5 21	5 7	4 51	4 42	4 32	4 19	4 5	3 58	3 50	3 42	3 32	3 21
8	6 35	6 21	6 6	5 48	5 38	5 26	5 13	4 56	4 48	4 39	4 30	4 18	4 5
9	7 36	7 22	7 6	6 48	6 38	6 26	6 12	5 55	5 47	5 38	5 28	5 16	5 3
10	8 35	8 22	8 7	7 51	7 41	7 30	7 17	7 1	6 53	6 45	6 35	6 24	6 12
11	9 31	9 19	9 7	8 52	8 44	8 34	8 23	8 9	8 3	7 56	7 48	7 39	7 29
12	10 23	10 14	10 4	9 52	9 46	9 38	9 29	9 18	9 13	9 8	9 2	8 55	8 47
13	11 11	11 5	10 58	10 50	10 45	10 40	10 34	10 26	10 23	10 19	10 15	10 10	10 5
14	11 57	11 54	11 50	11 45	11 43	11 40	11 36	11 32	11 31	11 28	11 26	11 24	11 21
15	12 41	12 40	12 40	12 39	12 38	12 38	12 37	12 36	12 36	12 36	12 35	12 35	12 34
16	13 24	13 26	13 29	13 31	13 33	13 35	13 37	13 39	13 40	13 42	13 43	13 45	13 46
17	14 6	14 12	14 17	14 23	14 27	14 31	14 36	14 41	14 44	14 47	14 50	14 54	14 58
18	14 50	14 57	15 6	15 15	15 20	15 27	15 34	15 43	15 47	15 51	15 56	16 2	16 8
19	15 34	15 44	15 54	16 7	16 14	16 22	16 32	16 43	16 49	16 55	17 1	17 9	17 17
20	16 19	16 31	16 44	16 59	17 8	17 17	17 29	17 43	17 50	17 57	18 5	18 14	18 24
21	17 6	17 20	17 34	17 51	18 1	18 12	18 25	18 40	18 48	18 56	19 6	19 16	19 28
22	17 55	18 9	18 25	18 42	18 52	19 4	19 18	19 34	19 42	19 51	20 1	20 12	20 25
23	18 45	18 59	19 14	19 32	19 42	19 54	20 7	20 24	20 32	20 41	20 50	21 2	21 14
24	19 35	19 48	20 3	20 19	20 29	20 40	20 52	21 8	21 16	21 24	21 32	21 43	21 54
25	20 25	20 37	20 50	21 4	21 13	21 22	21 34	21 47	21 53	22 0	22 8	22 17	22 27
26	21 14	21 24	21 35	21 47	21 54	22 1	22 10	22 21	22 26	22 32	22 38	22 45	22 52
27	22 4	22 11	22 19	22 27	22 32	22 38	22 44	22 52	22 55	22 59	23 3	23 8	23 14
28	22 53	22 57	23 1	23 6	23 9	23 12	23 16	23 20	23 22	23 24	23 27	23 29	23 32
29	23 42	23 43	23 44	23 45	23 45	23 46	23 46	23 48	23 48	23 48	23 49	23 49	23 50
30	...	...	...	...	...	...	...	...	...	...	...	...	...
31	0 32	0 30	0 27	0 24	0 22	0 20	0 18	0 15	0 14	0 12	0 11	0 9	0 7
32	1 24	1 18	1 12	1 5	1 1	0 56	0 51	0 44	0 41	0 38	0 34	0 31	0 26

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH, AND FOR SOUTHERN STATIONS.

For northern stations not on the meridian of Greenwich.—For longitudes twelve hours or less west from Greenwich obtain the data for the given latitude from Table X for the given date and for the date following; for longitude twelve hours or less east from Greenwich obtain the data for the given latitude from Table X for the given date and for the date preceding. Subtract the time on the earlier date from the time on the later and multiply the difference by the twenty-fourth part of the longitude in hours and decimals of an hour, positive if west, negative if east. Apply the product as a correction to the time on the given date.

For southern stations.—The instant of moonrise or moonset for any station south of the equator is that of moonset or moonrise, respectively, at a place of the same latitude north of the equator whose longitude is twelve hours different from that at the southern station.

If the southern station is twelve hours or less west from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day will be the same at the southern and northern stations. If, however, the phenomenon at the southern station occurs between midnight and noon, the local astronomical day at the northern station will be one day later than at the southern.

If the southern station is twelve hours or less east from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day at the northern station will be one less than at the southern station. If, however, the phenomenon occurs between midnight and noon, the local astronomical day will be the same at the two stations.

Having thus determined the true astronomical day at the northern station, compute by the rule for northern latitudes. For the desired local time of moonrise at the southern station change the time of moonset at the northern station twelve hours. For the desired local time of moonset at the southern station change the time of moonrise at the northern station twelve hours.

Example.—January 31, 1923, civil date, find the time of moonrise and moonset in longitude $9^{\text{h}} 40^{\text{m}}$ east from Greenwich and in latitude $37^{\circ} 50'$ south.

The longitude of the northern station is $2^{\text{h}}.3$ west from Greenwich and its latitude is $37^{\circ}.8$ N. Upon inspection of Table X it is seen that the astronomical day at the southern station is January 31 for moonrise and January 30 for moonset. the former phenomenon occurring between noon and midnight, the latter between midnight and noon. For the northern station in accordance with the precepts given above, both phenomena are to be computed for January 30.

At northern station---				Moonrise.			Moonset.		
				d	h	m	d	h	m
Table X, Lat. $+37^{\circ}.8$	.	.	.	Jan.	30	3 23	Jan.	30	17 49
Table X, Lat. $+37^{\circ}.8$	.	.	.		31	4 24		31	18 37
Difference	.	.	.			61			48
Product of Diff. by $+\frac{2.3}{24}$	.	.	.			+6			+5
Local astronomical mean time	.	.				3 29			17 54
At southern station---				Moonset.			Moonrise.		
				d	h	m	d	h	m
Local astronomical mean time	.	.			15	29		5	54
Civil time	.	.	.	Jan.	31	3 29 A. M.	Jan.	31	5 54 P. M.

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for Greenwich mean noon on pages 2–16 and for Washington apparent noon on pages 514–521.

The Mean Solar Day is the unit of mean solar time and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing

366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean. Astronomical time only is used throughout this volume.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to the Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–17 contain for Greenwich mean noon of each day the *Sun's Apparent Right Ascension, Apparent Declination, Semidiameter, Horizontal Parallax, True Longitude, and Latitude*. They also contain the *Logarithm of the Radius Vector of the Earth, the Precession in Longitude, the Nutation in Longitude, the Aberration, the True Obliquity, the Equation of Time, the Sidereal Time or Right Ascension of Mean Sun, and the Mean Time of Sidereal Noon*. Adjoining columns contain, for each Greenwich mean noon, the *Variation per*

Hour for those of the quantities for which it seemed advisable to give a rate of motion. By multiplying any one of those variations by the hours and parts of an hour from Greenwich mean noon and adding the product algebraically to the corresponding quantity at noon, we obtain an approximate value of the quantity in question for any given Greenwich mean time. If great exactness is desired, the value of the hourly variation is found for the time halfway between Greenwich mean noon and the given Greenwich mean time before multiplying by the hours and parts of an hour from Greenwich mean noon.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations or latitudes indicates north and the negative sign south.

The Sun's *Apparent Right Ascension* and *Declination* are affected both by aberration and by nutation, and therefore denote the *apparent* position of the true Sun. The Sun's *True Longitude* is the true geometric longitude not corrected for aberration; it is referred to the true equinox.

The Sun's *Latitude* is referred to the ecliptic of the date.

The Sun's *Declination* is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth.

The Sun's *Semidiameter* is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The *Horizontal Parallax* is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

The *Precession in Longitude* is the quantity to be applied to the longitude of the Sun referred to the mean equinox of the beginning of the Besselian fictitious year, i. e., the instant when the Sun's mean longitude is 280° , in order to refer it to the mean equinox of date.

The *Nutation in Longitude* is the quantity to be applied to the longitude of a body referred to the mean equinox of date in order to refer it to the true equinox, short-period terms being neglected.

The *Aberration* is the quantity to be subtracted from the true longitude of the Sun in order to obtain its apparent longitude.

The *True Obliquity* is the inclination of the Earth's equator to the ecliptic, short-period terms being neglected.

The corrections to the values of the nutation and the obliquity here given, to take account of the short-period terms, may be found on pages 215-216.

The *Equation of Time* is the apparent time of Greenwich mean noon, or the hour angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude or to any Greenwich mean time by using the hourly variation, $+9^s.8565$; or by Table III, page 693 of this volume, for reducing intervals of mean time to sidereal time. It is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time,

and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time past noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 690 of this volume. If the sidereal interval is less than $3^m 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean-time interval between these two mean times being $23^h 56^m 4^s.09$. The mean time, approximately known, will always show which one is to be taken. Instead of using Table II the reduction of a sidereal to a mean-time interval may be found by multiplying $-9^s.8296$ by the hours and parts of an hour of the sidereal interval.

The *Mean Time of Sidereal Noon* is the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich; it may be reduced to any other meridian by using the hourly variation, $-9^s.8296$, to effect the necessary interpolation, or the reduction may be taken directly from Table II. In the same way the reduction may be made to any Greenwich sidereal time, and the result will then represent 24^h —Right Ascension of the Mean Sun. This column may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

As examples of the use of pages 2–17:

1. Let the Sun's declination be required for April 14, 1923, $2^h 5^m 20^s$, P. M., at a place whose longitude is $58^\circ 20'$, or $3^h 53^m 20^s$ west from Greenwich:

Local mean time	April 14,	$2^h 5^m 20^s$
Longitude from Greenwich (additive)		$3^h 53^m 20^s$
Greenwich mean time	April 14,	$5^h 58^m 40^s$

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich mean noon on April 14, or $18^h.022$ before Greenwich mean noon on April 15.

On page 6 of the Ephemeris we find that the variation of declination per hour is:

At Greenwich mean noon, April 14	$+54.30$
At Greenwich mean noon, April 15	$+53.91$
Difference for one day	-0.39

If great exactness is desired, we find the amount of this hourly variation for the time halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 14th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

Variation at Greenwich mean noon, April 14	"	+54.30
Change in 0.125 of a day	-0".39×0.125	- 0.05
Variation at 3 hours after noon		+54.25
Declination at Greenwich noon, April 14	+9 8 9.4	
Change in 5.978 hours	+54".25×5.978	+ 5 24.3
Sun's declination at time of observation		+9 13 33.7

With equal facility the computation might have been made backward from the succeeding noon. Thus in the example just given the time is 18^h.022 before Greenwich noon of April 15; half this interval is about 0.375 of a day, and the hourly motion for the middle of the interval is +54".06. Then we find:

Declination at Greenwich noon, April 15	° ' "	+9 29 47.9
Change in -18.022 hours	+54".06×-18.022	- 16 14.3
Sun's declination at time of observation		+9 13 33.6

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly the one derived from the nearest noon should be regarded as the more accurate.

2. Let the Sun's right ascension and the equation of time be required for July 13, 1923, 10^h 3^m 30^s, A. M., mean time, at a place whose longitude is 85° 15', or 5^h 41^m west from Greenwich.

Local astronomical mean time	July 12,	^h ^m ^s 22 3 30
Longitude from Greenwich (additive)		5 41 0
Greenwich mean time	July 13,	^h 3 44 30=3.7417
<i>Sun's Right Ascension.</i>		<i>Equation of Time.</i>
Greenwich noon, July 13	^h ^m ^s 7 26 48.46	^m ^s -5 26.10
Change in 3.7417 hours	10 ^s .172×3.7417 +38.06 -0 ^s .315×3.7417	- 1.18
	<u>7 27 26.52</u>	<u>-5 27.28</u>

In this case the hourly variations interpolated to half the interval, or 1^h.87 after noon, have been used.

3. If the sidereal time is required for the same time and place, we have:

Sidereal time at Greenwich mean noon, July 13	^h ^m ^s 7 21 22.36
Reduction for 3 ^h 41 ^m 30 ^s from Table III, or 9 ^s .8565×3.7417	+36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time (rejecting 24 ^h)	<u>5 25 29.24</u>

4. On July 13, 1923, A. M., at a place whose longitude is 85° 15' W., suppose the sidereal time to be 5^h 25^m 29^s.24 and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h 41^m 0^s$, or $+5^h.6833$.

First solution.

Sidereal time at Greenwich mean noon July 12,	^h ^m ^s 7 17 25.80
Reduction for $5^h 41^m 0^s$ from Table III, or $9^s.8565 \times 5.6833$	+56.02
The sidereal time at local mean noon, July 12	7 18 21.82
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 25 29.24
Subtracting the first from the second gives the sidereal interval from noon	22 7 7.42 = $22^h.1187$
Reduction for $22^h 7^m 7^s.42$ from Table II, or $-9^s.8296 \times 22.1187$	-3 37.42
The required astronomical mean time July 12,	22 3 30.00

Second solution.

Mean time at Greenwich sidereal noon July 12,	^h ^m ^s 16 39 49.95
Reduction for longitude from Table II, or $-9^s.8296 \times 5.6833$	-55.86
Mean time of <i>preceding</i> local sidereal noon July 12,	16 38 54.09
Add the given sidereal time	5 25 29.24
Reduction for $5^h 25^m 29^s.24$ from Table II, or $-9^s.8296 \times 5.4248$	-53.32
The required astronomical mean time July 12,	22 3 30.01

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

Pages 18-25 contain the rectangular coordinates of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox as the plane and point of reference. Each coordinate is given for every Greenwich mean noon and midnight. The columns *Reduc. to Mean Eq'x of 1923.0* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and equinox of the beginning of the Besselian fictitious year.

Pages 26-117 contain *The Moon's Right Ascension and Declination* for each day and hour of Greenwich mean time, referred to the true equator and equinox. They are accompanied by columns of *Variations per Minute*, by means of which interpolation may be conveniently made to any moment of Greenwich mean time. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Var. per Min.* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added numerically in case of the right ascension and algebraically in case of the declination.

Thus, suppose the Moon's right ascension and declination are required for January 25, 1923, $10^h 10^m 30^s$, astronomical mean time at Greenwich:

	<i>Right Ascension.</i>	<i>Declination.</i>
	^h ^m ^s	[°] ['] ["]
January 25, 10^h	2 47 46.60	+11 56 0.8
Change in 10.5 minutes $1^s.9876 \times 10.5$	20.87 + $7''.292 \times 10.5$	+1 16.6
January 25, $10^h 10^m 30^s$	2 48 7.47	+11 57 17.4

For the sake of precision the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page 117 contains also the *Phases of the Moon* and the dates of the *Moon's Apogee and Perigee*, or the greatest and least distances from the Earth.

Pages 118–133 contain for every Greenwich mean noon and midnight the *Moon's Longitude* and *Latitude* referred to the true equinox and the ecliptic, its *Semidiameter*, and its *Equatorial Horizontal Parallax*. The column adjoining that of the horizontal parallax gives the variation of that quantity per hour, by means of which it can be reduced to any other Greenwich mean time in the manner shown in the preceding examples. When allowing for change in the variation itself, note must be taken of the fact that the tabular interval is here 12 hours instead of 24. The quantity thus obtained is the equatorial horizontal parallax; to obtain the horizontal parallax at any given place, the correction for the latitude of the place must be applied. The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see page xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for March 10, 1923, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is 5''.9; then,

$$12^h : 7^h :: 5''.9 : 3''.4$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^h, is therefore 15' 38''.9.

The Moon's semidiameter and horizontal parallax are required for all observations of the Moon.

Pages 118–133 contain also: The *Moon's Age*, or the time elapsed since the preceding new Moon, given to tenths of a day; the mean time of the *Moon's Transit, Upper and Lower*, at Greenwich, given to tenths of a minute; and the *Variation per Hour* of the latter quantity, that is, the variation for one hour of longitude, by means of which the local time of an upper or lower transit of the Moon may be computed for any place whose longitude is known.

Pages 134–198 contain for each of the seven major planets the geocentric ephemeris followed immediately by the heliocentric ephemeris.

The geocentric ephemeris gives the planet's *Apparent Right Ascension* and *Apparent Declination* with the respective *Variations per Hour* or *per Day*. The positions thus given are referred to the true equator and equinox, and are corrected for aberration. The geocentric ephemeris gives also the *Logarithm of Distance from Earth* with the *Variation per Hour* or *per Day*, the planet's *Semidiameter* and *Horizontal Parallax*, and, to tenths of a minute, the time of *Transit Meridian of Greenwich*. All the data, except the last named, are given for Greenwich mean noon.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that already given for the Sun. The local mean time of meridian transit of any planet at any place can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich transit.

The heliocentric ephemeris gives the *Heliocentric Longitude, Mean Equinox of Date*; the *Heliocentric Latitude*; and the *Logarithm of Radius Vector*; with

their respective *Variations per Day*. The heliocentric longitude may be referred to the true equinox by applying nutation. The variations are given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude measured along the orbit of the planet. This orbit longitude is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The heliocentric latitude is referred to the ecliptic of the date. The *Logarithm of Radius Vector* is the logarithm of the distance of the center of the planet from that of the Sun.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 200–201 contain formulæ for reducing mean positions of stars to apparent positions, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 202–205 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at any of the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of α Aquilæ, May 26, 1923, for the upper transit at Washington.

log <i>a</i>	0.5165	log <i>b</i>	7.2481 <i>n</i>	log <i>c</i>	8.0477	log <i>d</i>	8.8234 <i>n</i>
log <i>A</i>	9.4732	log <i>B</i>	0.9704	log <i>C</i>	0.8996 <i>n</i>	log <i>D</i>	1.2684 <i>n</i>
log <i>a'</i>	0.5203	log <i>b'</i>	9.9940	log <i>c'</i>	9.4343	log <i>d'</i>	8.4187 <i>n</i>
log <i>Aa</i>	9.9897	log <i>Bb</i>	8.2185 <i>n</i>	log <i>Cc</i>	8.9473 <i>n</i>	log <i>Dd</i>	0.0918
log <i>Aa'</i>	9.9935	log <i>Bb'</i>	0.9644	log <i>Cc'</i>	0.3339 <i>n</i>	log <i>Dd'</i>	9.6871
Mean Place, 1923.0				α_0	^h 18 ^m 38 ^s 3.536	δ_0	[°] -9 ['] 7 ^{''} 38.89
				<i>Aa</i>	+0.977	<i>Aa'</i>	+0.99
				<i>Bb</i>	-0.017	<i>Bb'</i>	+9.21
				<i>Cc</i>	-0.089	<i>Cc'</i>	-2.16
				<i>Dd</i>	+1.235	<i>Dd'</i>	+0.49
				<i>E</i>	+0.001	$\tau\mu'$	0.00
				$\tau\mu$	+0.001		
Apparent Place, May 26,				α	^h 18 ^m 38 ^s 5.644	δ	[°] -9 ['] 7 ^{''} 30.36

Pages 206–213 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 200, which also contains the formulæ

and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants $a, b, c, d, a', b', c', d'$, while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of 2 Aquilæ, May 26, 1923, for the upper transit at Washington

$G =$	$\begin{smallmatrix} h & m \\ 3 & 49.7 \end{smallmatrix}$	$\delta_0 =$	$\begin{smallmatrix} ^\circ & ' \\ -9 & 7.6 \end{smallmatrix}$
$a_0 =$	18 38.1	$G + a_0 =$	22 ^h 27 ^m .8
$H =$	13 32.6	$H + a_0 =$	8 10 ^m .7
$\log \tau$	8.8239	$\log \tau$	8.8239
$\log g$	1.0446	$\log h$	1.3049
$\log \sin (G + a_0)$	9.5928 <i>n</i>	$\log \sin (H + a_0)$	9.9252
$\log \tan \delta_0$	9.2059 <i>n</i>	$\log \sec \delta_0$	0.0055
$\log (g)$	8.6672	$\log (h)$	0.0595
$\log g$	1.0446	$\log h$	1.3049
$\log \cos (G + a_0)$	9.9639	$\log \cos (H + a_0)$	9.7323 <i>n</i>
$\log (g')$	1.0085	$\log \sin \delta_0$	9.2004 <i>n</i>
$\log i$	0.5368 <i>n</i>	$\log (h')$	0.2376
$\log \cos \delta_0$	9.9945		
$\log (i)$	0.5313 <i>n</i>		
		a_0	$\begin{smallmatrix} h & m & s \\ 18 & 38 & 3.536 \end{smallmatrix}$
		$f + f'$	+0.913
		(g)	+0.046
		(h)	+1.147
		$\tau \mu$	+0.001
		α	$\begin{smallmatrix} h & m & s \\ 18 & 38 & 5.643 \end{smallmatrix}$
		δ_0	$\begin{smallmatrix} ^\circ & ' & '' \\ -9 & 7 & 38.89 \end{smallmatrix}$
		(g')	+10.20
		(h')	+1.73
		(i)	-3.40
		$\tau \mu'$	0.00
		δ	$\begin{smallmatrix} ^\circ & ' & '' \\ -9 & 7 & 30.36 \end{smallmatrix}$

Page 214 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 316-513, for which data containing short-period terms should not be employed.

Pages 215-216 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 201, and the coefficients mentioned later, which are given for each star on pages 316-513.

Pages 217-230 contain the *Mean Places of Ten-day Stars* for the beginning of the Besselian fictitious year. These pages give also the magnitude, spectral type, annual variations, and proper motions for each star. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Page 231 contains, for the *Circumpolar Stars*, the same data as the immediately preceding pages do for the ten-day stars.

Pages 232-315 contain for every upper transit at Washington the apparent positions of seventeen northern and eighteen southern circumpolar stars arranged in the order of their right ascensions. The mean solar time of transit is given in the column *Washington Mean Time*, in order that each transit above

and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 232 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit of July 1 precedes the upper one, which occurs July 1.8. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Washington Mean Time*.

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 316-513 contain, for every tenth upper transit at Washington, the apparent places of 790 stars, being all those given in the list of mean places of ten-day stars. The *Washington Mean Time* in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each ten-day star there are given at the foot of the page (1) the seconds of the mean place in both right ascension and declination for the beginning of the year, (2) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 201.

Pages 514-521 contain, for Washington apparent noon, the *Apparent Right Ascension* and *Declination* of the Sun, the *Equation of Time*, and the *Variation per Hour* of these quantities; the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*. The last column on each page contains the *Sidereal Time of Mean Noon*.

The *Equation of Time, Mean-App.*, is the correction to be applied to apparent time in order to obtain mean time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington counted from the nearest noon.

Pages 522-537 contain the *Right Ascension of Center*, the *Geocentric Declination of Center*, the *Sidereal Time of Semidiameter Passing Meridian*, the *Geocentric Semidiameter*, and the *Equatorial Horizontal Parallax* of the Moon, and the *Washington Mean Time* at the moment of each upper and lower transit over the meridian of Washington.

The *Variation per Hour of Longitude* is the correction to be applied in each case to the quantity in the preceding column to obtain its value for the time of transit over the meridian one hour west of Washington, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The quantities in the third column, when corrected for another longitude by the hourly variations, give the local mean time of transit for that longitude. By means of the variations per hour of longitude any one of the quantities under consideration can be computed with great exactness for the moment of transit over any meridian not more than one hour

distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Washington Mean Time*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let V represent the corresponding *Variation per Hour of Longitude*. Write down three successive values of F , together with the corresponding values of V , and difference the latter as in the following scheme, where the middle values, F_o and V_o , belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ :—

Function.	Var. per Hour of Longitude.	Δ'	Δ''
F_{-1} F_o F_{+1}	V_{-1} V_o V_{+1}	a' a''	b

Then, for the culmination at the meridian λ

$$F\lambda = F_o + \lambda V_o + \frac{\lambda^2}{48} (a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_o). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within $1''$ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a footnote.

Pages 538–553 contain for six of the major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, *Sidereal Time of Semidiameter Passing Meridian*, and the *Washington Mean Time*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The stellar magnitude at opposition for Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Greenwich mean time, except in the case of the occultations visible at Washington, where Washington time is used.

Pages 556–563 contain all necessary data respecting the solar and lunar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse

remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50. The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane, together with the latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of Sept. 10, 1923, begins and ends at San Diego, Calif., whose latitude is $+32^{\circ} 43'$ and whose longitude is $+117^{\circ} 10'$.

For the beginning we compare the distance of the place from the curves of 7^h and 8^h and find it to correspond to about 30 minutes from the former, thus giving for the approximate time of beginning 7^h 30^m; for the end we compare the distance of the place from the curves of 10^h and 11^h and find it to

correspond to about 20 minutes from the former, thus giving for the approximate time of ending $10^h 20^m$; and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.				Ending.		
		d	h	m		d	h	m
Greenwich mean time	. . . . .	Sept. 10	7	30		10	10	20
Longitude west	. . . . .			7 49				7 49
Local mean time	. . . . .	Sept. 9	23	41		10	2	31

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit, the measurements being made upon a line drawn through the place perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements, which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy . We take the intersection of this plane with that of the Earth's equator as the axis of x , and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x , and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d , of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2 , the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x' , y' , and μ' , which are the changes of x , y , and μ , in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that the distance of the observer from the axis of the shadow cones is equal to the radius of the penumbra at the point of observation for the beginning and ending of the eclipse, and is equal to the radius of the umbra at the

point of observation for the beginning and ending of totality or of the annular phase. To find this distance and radius in each case, we proceed as follows:

(1) The coordinates of the observer, ξ , η , and ζ , together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F .	Log G .
0°	0.00000	0.00293
5	0.00001 1	0.00292 1
10	0.00004 3	0.00289 3
15	0.00010 6	0.00283 6
20	0.00017 7	0.00276 7
25	0.00026 9	0.00276 9
30	0.00037 11	0.00267 11
35	0.00048 11	0.00256 11
40	0.00060 12	0.00245 13
45	0.00073 13	0.00232 12
50	0.00086 13	0.00220 13
55	0.00098 12	0.00207 12
60	0.00110 12	0.00195 12
65	0.00120 10	0.00183 10
70	0.00129 9	0.00173 9
75	0.00137 8	0.00164 8
80	0.00142 5	0.00156 5
85	0.00145 3	0.00151 3
90	0.00148 1	0.00148 2

For the assumed Greenwich mean time of computation, take from the table of elements the values of $\sin d$, $\cos d$, and μ . Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be --

$$\begin{aligned}\xi &= \rho \cos \varphi' \sin (\mu - \lambda) \\ \eta &= \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2 \\ \zeta &= \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2\end{aligned}$$

and their variations in one minute of mean time will be—

$$\begin{aligned}\xi' &= [7.63986] \rho \cos \varphi' \cos (\mu - \lambda) \\ \eta' &= [7.63986] \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63986] \xi \sin d \\ \zeta' &\text{ is not needed.}\end{aligned}$$

(2) For the same assumed moment of Greenwich mean time, take from the table of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y' , and their logarithms are given beneath the tables of x and y .

(3) The distance m and position-angle M of the axis of the shadow relative to the observer, and the relative motions, n and N , are computed by the formulæ—

$$\begin{aligned}m \sin M &= x - \xi \\ m \cos M &= y - \eta \\ n \sin N &= x' - \xi' \\ n \cos N &= y' - \eta'\end{aligned}$$

(4) Both for the umbra and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being taken from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation—

$$\sin \psi = \frac{m \sin (M - N)}{L}$$

There will be two values for this angle; the one for which $\cos \psi$ is negative must be taken for the beginning of the eclipse, for the beginning of the annular phase, or for the ending of the total phase, but the one for which $\cos \psi$ is positive must be taken for the ending of the eclipse, for the ending of the annular phase, or for the beginning of the total phase. The correction τ to the assumed time will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M - N)}{n} + \frac{L \cos \psi}{n}$$

However, only in case the value of τ does not exceed a few minutes can the time thus corrected be considered even fairly accurate. Therefore it is best to commence the computation by assuming times near the phenomena wanted. The times for the beginning and the ending of an eclipse may be

derived from the chart with sufficient exactness as previously explained; the time for the total or for the annular phase may then be assumed as midway between the times assumed for the beginning and the ending of the eclipse; or, in case of a partial eclipse, this time midway may be assumed as that of the maximum eclipse.

The more accurate times resulting from the computation as outlined above and as illustrated in the example below may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a value of τ in each case, which should be very small, and which should give a very accurate time of the phenomenon. Such a repetition of the computation will be advisable, moreover, for the reason that it will enable one to locate and eliminate any accidental numerical errors that may have occurred in the first computation.

As a result of this last approximation the computed times of contact will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction.

Position-angle of Point of Contact.—The position-angle P , of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formula—

$$P = N + \psi$$

where the results of the last approximation are used.

The position-angle V , of the point of contact, reckoned from the vertex of the Sun's limb toward the east, is found by the formula—

$$V = P - C$$

where C is obtained from

$$\tan C = \frac{\xi}{\eta}$$

$\sin C$ having the same algebraic sign as ξ , and the results of the last approximation again being used.

Time of Maximum Eclipse.—For a partial eclipse, or for a central eclipse at a point at which the eclipse is only partial indicated by $\sin \psi$ greater than unity for the umbra, the correction to the assumed time to obtain the time of maximum eclipse is given by the formula—

$$\tau = - \frac{m \cos (M - N)}{n}$$

For a central eclipse at a point at which the eclipse is total or annular, the above formula gives the correction to the assumed time to obtain the true time of mid-eclipse.

Magnitude of Maximum Partial Eclipse.—This is given by the formula—

$$D^* = \frac{L - \Delta}{2L - 0.5459}$$

where $\Delta = \pm m \sin (M - N)$, always taken positive, and L is the radius of the penumbra. In a partial eclipse D is the fraction of the Sun's diameter covered

* The denominator of this expression, as given by CHAUVENET, is $2(L - k)$; the denominator here used is obtained from CHAUVENET's by substituting 0.272274 for k , and then diminishing the result by the $1/400$ part in order to allow for the fact that in deriving his formula CHAUVENET assumes the angle of the umbral cone equal to that of the penumbral.

by the Moon; but in all cases D is the ratio to the Sun's diameter of the straight line passing through the centers of the two disks and having for its extremities the Sun's limb that is nearest to the Moon's center and the Moon's limb that is nearest to the Sun's center.

Magnitude during Annular Phase.— A , the ratio of the Moon's apparent diameter to the Sun's apparent diameter, or the fraction of the Sun's diameter covered by the Moon, is given by the formula—

$$A = \frac{0.5459}{2L - 0.5459}$$

At mid-eclipse the portion of the Sun's diameter uncovered at the broadest part of the annulus is equal to $1-D$, and at the narrowest part, to $D-A$. D is computed by the formula already given.

Magnitude during Total Phase.—As in the preceding case, A , the ratio of the Moon's apparent diameter to the Sun's apparent diameter (in this case greater than unity) is given by the formula—

$$A = \frac{0.5459}{2L - 0.5459}$$

At mid-eclipse, however, the least distance between the limb of the Sun and the limb of the Moon, the Sun's diameter being taken as unity, is equal to $D-1$, and the greatest, to $A-D$.

Computation of the Solar Eclipse of September 10, 1923, for San Diego, Calif.

The position of San Diego is—

° ' "

Latitude, $\phi = + 32 \ 43 \ 0$
Longitude, $\lambda = + 117 \ 10 \ 0$

and its geocentric coordinates are—

$$\begin{aligned} \rho \sin \phi' &= [9.73028] \\ \rho \cos \phi' &= [9.92541] \end{aligned}$$

From the eclipse chart we find the approximate times of the phases to be—

		Beginning Sept.			d h m					
		10 9 0			10 9 0			Greenwich Mean Time.		
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					
		10 10 20			10 10 20					

	Beginning.	Middle.	Ending.		Beginning.	Middle.	Ending.
x'	+0.009056	+0.009057	+0.009055	l	+0.53867	-0.00733	+0.53841
ξ'	+0.003666	+0.003484	+0.002874	$\zeta \tan f$	+0.00411	+0.00390	+0.00327
$x' - \xi'$	+0.005390	+0.005573	+0.006181	L	+0.53456	-0.01123	+0.53514
y'	-0.002818	-0.002821	-0.002824	$\log m$	9.73757	7.98685	9.72525
η'	-0.000023	+0.000104	+0.000203	$\log \sin (M-N)$	7.81494	9.87589	8.47846
$y' - \eta'$	-0.002795	-0.002925	-0.003027	$\text{colog } L$	0.27200	1.94962 _n	0.27153
$\log m \sin M$	9.68731 _n	7.35793	9.67192	$\log \sin \psi$	7.82451	9.81236 _n	8.47524
$\log \sin \text{ or } \cos M$	9.94974 _n	9.98766 _n	9.94667	ψ	179 37 3	$\begin{Bmatrix} 319 & 31 & 16 \\ 220 & 28 & 44 \end{Bmatrix}$	$\begin{Bmatrix} 1 & 42 & 42 \end{Bmatrix}$
$\log m \cos M$	9.39513	7.97451 _n	9.39423 _n	$\log m/n$	1.95427	0.18792	1.88751
$\log \tan \dot{M}$	0.29218 _n	9.38342 _n	0.27769 _n	$\log \cos (M-N)$	9.99999 _n	9.81942	9.99981
$\log n \sin N$	7.73159	7.74609	7.79106	$\log (1)$	1.95426 _n	0.00734	1.88732
$\log \sin \text{ or } \cos N$	9.94829	9.94716	9.95332	$\log L$	9.72800	8.05038 _n	9.72847
$\log n \cos N$	7.44638 _n	7.46613 _n	7.48101 _n	$\log \cos \psi$	9.99999 _n (\pm)	9.88118	9.99981
$\log \tan N$	0.28521 _n	0.27996 _n	0.31005 _n	$\text{colog } n$	2.21670	2.20107	2.16226
M	297 2 6	166 24 28	117 49 0	$\log (2)$	1.94469 _n (\mp)	0.13263	1.89054
N	117 24 33	117 41 35	116 5 32	-(1)	+90.004	-1.017	-77.147
$M-N$	179 37 33	48 42 53	1 43 28	+(2)	-88.042	\mp 1.357	+77.722
$\log m$	9.73757	7.98685	9.72525	τ	+ 1.962	$\begin{Bmatrix} -2.374 \\ +0.340 \end{Bmatrix}$	+0.575
$\log n$	7.78330	7.79893	7.83774	T	$\begin{matrix} d & h & m \\ 10 & 7 & 30 \end{matrix}$	$\begin{matrix} d & h & m \\ 10 & 9 & 0 \end{matrix}$	$\begin{matrix} d & h & m \\ 10 & 10 & 20 \end{matrix}$
$\log \zeta$	9.94683	9.92580	9.84721	$T+\tau$	$\begin{matrix} d & h & m \\ 10 & 7 & 31.962 \end{matrix}$	$\begin{Bmatrix} d & h & m \\ 10 & 8 & 57.626 \\ 10 & 9 & 0.340 \end{Bmatrix}$	$\begin{matrix} d & h & m \\ 10 & 10 & 20.575 \end{matrix}$
$\log \tan f$	7.66689	7.66473	7.66690				
$\log \zeta \tan f$	7.61372	7.59053	7.51411				

Taking the four times just found, a new computation is made in each case. The times resulting from the new computation are—

	Greenwich Mean Time.	Local Mean Time.
	$\begin{matrix} d & h & m & s \\ 10 & 7 & 31 & 57.6 \end{matrix}$	$\begin{matrix} d & h & m & s \\ 9 & 23 & 43 & 17.6 \end{matrix}$
Beginning of the eclipse . . .	September 10 7 31 57.6	September 9 23 43 17.6
Beginning of total eclipse . . .	8 57 37.2	10 1 8 57.2
Ending of total eclipse . . .	9 0 20.2	1 11 40.2
Ending of the eclipse . . .	10 20 34.7	2 31 54.7

The values from the last approximation of the quantities needed in computing the position angles, and the computation of these position angles, are—

	1st Contact.	2d Contact.	3d Contact.	4th Contact.
$\log \xi$	8.70582 _n	9.41457	9.43012	9.72155
$\log \eta$	9.66304	9.66665	9.66692	9.67867
$\log \tan C$	9.04278 _n	9.74792	9.76320	0.04288
N	117.44	117.72	117.68	116.07
ψ	179.58	319.64	220.52	1.73
P	297.02	77.36	338.20	117.80
C	353.70	29.23	30.10	47.82
V	303.3	48.1	308.1	70.0

The quantities needed in computing A , $A-D$, and $D-1$, and the computation of these three expressions, are—

			2d Contact.	3d Contact.	
$\log \zeta$			9.92720	9.92558	
$\log \Delta = \log m \sin (M-N)$			7.86209	7.86267	
T	8 ^h 59 ^m	l_1	+0.5385	$2L-0.5459$	+0.5233
$\log \zeta$	9.9264	$\zeta \tan f_1$	+0.0039	D	1.008
$\log \tan f_1$	7.6669	L	+0.5346	A (Magnitude)	1.043
$\log \zeta \tan f_1$	7.5933	Δ	+0.0073	$A-D$	0.035
		$L-\Delta$	+0.5273	$D-1$	0.008

Pages 564–567 contain the adopted mean places and annual proper motions of such stars, as bright as magnitude 6.5, as will be occulted during the year by the Moon.

Pages 568–607 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1923.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1923 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Greenwich Mean Time* is the moment, T , at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle, H*, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Greenwich—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the time of immersion and emersion of a star relative to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H - \lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T - \lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T —the instant of geocentric conjunction of Moon and star in right ascension, expressed in Greenwich mean time;

H —the Greenwich west hour-angle of the two bodies at that moment;

λ —the longitude west of Greenwich;

$h_0 = H - \lambda$ —the local hour-angle of the star at the instant T ;

δ —the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 758.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction, which must be reckoned in mean solar hours, and will be designated by the symbol t . It will have the same sign as h_0 . This correction may be computed from the formulæ—

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos \frac{4}{3} h_0$$

$$t = \frac{\xi_0}{\xi' - \xi}$$

By applying t to the Greenwich mean time of geocentric conjunction, as given with the elements, we shall have the Greenwich mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t :

$$\xi = \rho \cos \varphi' \sin (h_0 + t_0)$$

$$\eta = \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta \cos (h_0 + t_0) = \eta_1 - \eta_2$$

$$\xi' = [9.4192] \rho \cos \varphi' \cos (h_0 + t_0)$$

$$\eta' = [9.4192] \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192] \xi \sin \delta$$

$$x = x't$$

$$y = Y + y't$$

Compute also m , M , n , N , and ψ from the equations—

$$m \sin M = x - \xi$$

$$m \cos M = y - \eta$$

$$n \sin N = x' - \xi'$$

$$n \cos N = y' - \eta'$$

$$\sin \psi = [0.5646] m \sin (M - N)$$

ψ being taken between the limits $\pm 90^\circ$.

Finally compute,

$$\tau = -\frac{[1.7782]m}{n} \cos (M-N) \mp \frac{[1.2135]}{n} \cos \psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n \cos \psi} [\eta_2 \cos (N \mp \psi) - \xi \sin (N \mp \psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated, respectively, τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Greenwich mean times of the phases,

$$\begin{aligned}\text{Instant of immersion} &= T + t + \tau' + \delta\tau' \\ \text{Instant of emersion} &= T + t + \tau'' + \delta\tau''\end{aligned}$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results it will be advisable to compute ξ , η , x , and y for the times of immersion and emersion finally obtained. If these times are correct, the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2 + (y-\eta)^2} = 0.2725$$

If $\log m \sin (M-N) > 9.4354$, $\sin \psi$ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semi-diameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P . It is computed from the formulæ—

$$\begin{aligned}P &= N - \psi + \delta P && \text{for immersion,} \\ \text{or } P &= N + \psi + \delta P \pm 180^\circ && \text{for emersion,}\end{aligned}$$

where the angles $N - \psi$ and $N + \psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp \frac{[7.3038]\tau^2}{\cos \psi} [\eta_2 \sin N + \xi \cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V , is also reckoned in the direction from the north toward the east, and is found from the formula

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180° , according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

As an example of an isolated occultation we will compute that of α Tauri on January 27, 1923, for Boston, Mass., whose position is—

$$\begin{aligned}\varphi &= +42^{\circ} 20' 58'' \\ \lambda &= + 4^{\text{h}} 44^{\text{m}} 19^{\text{s}}\end{aligned}$$

and whose geocentric coordinates are—

$$\begin{aligned}\rho \sin \varphi' &= [9.8262] \\ \rho \cos \varphi' &= [9.8693]\end{aligned}$$

From the elements on page 570 we have—

$$\begin{aligned}T &= \begin{matrix} \text{h} & \text{m} \\ 11 & 58.4 \end{matrix} \\ H &= + 3 \ 51.9 \\ h_0 &= II - \lambda = - 0 \ 52.4\end{aligned}$$

From the formulæ on page 764 we find the correction, t , to the Greenwich mean time of geocentric conjunction, T , to be about $-0^{\text{h}} 27^{\text{m}}.0$; therefore the Greenwich mean time of apparent conjunction is—

$$T+t = \text{Jan. 27, } 11^{\text{h}} 31^{\text{m}}.4$$

α Tauri	Apparent Declination, +16 21.2	G. M. T. of ζ d h m Jan. 27 11 58.4	Hour Angle. h m +3 51.9	Y +0.4799	x' 0.5584	y' +0.0736
----------------	-----------------------------------	---	-------------------------------	----------------	----------------	-----------------

h_0	$\begin{matrix} \text{h} & \text{m} \\ -0 & 52.4 \end{matrix}$	$y't$	-0.0331	$\log m$	6.7526
t_0	-0 27.1	Y	+0.4799	$\log n$	9.5874
h_0+t_0	-1 19.5	x	-0.2512	$\log \text{const.}$	0.5646
$\log (\rho \cos \varphi')$	9.8693	ξ	-0.2516	$\log m$	6.7526
$\log \sin (h_0+t_0)$	9.5315 n	$x-\xi$	+0.0004	$\log \sin (M-N)$	9.9322
$\log \xi$	9.4008 n	y	+0.4468	$\log \sin \psi$	7.2494
$\log (\rho \sin \varphi')$	9.8262	η	+0.4472	ψ	+0° 6'
$\log \cos \delta$	9.9821	$y-\eta$	-0.0004	$\log \text{const.}$	1.7782
$\log \eta_1$	9.8083	x'	+0.5584	$\log m/n$	7.1652
$\log (\rho \cos \varphi')$	9.8693	ξ'	+0.1828	$\log \cos (M-N)$	9.7144
$\log \sin \delta$	9.4496	$x'-\xi'$	+0.3756	$\log (1)$	8.6578
$\log \cos (h_0+t_0)$	9.9733	y'	+0.0736	$\log \text{const.}$	1.2135
$\log \eta_2$	9.2922	η'	-0.0186	$\text{colog } n$	0.4126
η_1	+0.6432	$y'-\eta'$	+0.0922	$\log \cos \psi$	0.0000
$-\eta_2$	-0.1960			$\log (2)$	1.6261
$\log (\rho \cos \varphi')$	9.8693	$\log m \sin M$	6.6021		
$\log \cos (h_0+t_0)$	9.9734	$\log \cos M$	9.8495 n	$-(1)$	$\begin{matrix} \text{m} \\ - 0.05 \end{matrix}$
$\log \text{const.}$	9.4192	$\log m \cos M$	6.6021 n	$\mp (2)$	∓ 42.28
$\log \xi$	9.4008 n	$\log \tan M$	0.0000 n	τ for immersion	-42.33
$\log \sin \delta$	9.4496			τ for emersion	+42.23
$\log \xi'$	9.2619	$\log n \sin N$	9.5747		
$\log \eta'$	8.2696 n	$\log \sin N$	9.9873		
$\log x'$	9.7469	$\log n \cos N$	8.9647		
$\log t$	9.6530 n	$\log \tan N$	0.6100		
$\log y'$	8.8669				
$\log x$	9.3999 n	M	$\begin{matrix} \circ & ' \\ 135 & 0 \end{matrix}$		
$\log y't$	8.5199 n	N	76 12		
		$M-N$	58 48		

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.		Immersion.	Emersion.
$N\mp\psi$	76° 6'	76° 18'	$\log [(1)-(2)]$	9.4645	9.4637
$\log \cos (N\mp\psi)$	9.3806	9.3745	$\log \text{const.}$	6.7591	6.7591
$\log \eta_2$	9.2922	9.2922	$\log \tau^2$	3.2532	3.2512
$\log (1)$	8.6728	8.6667	$\text{colog } (\eta \cos \psi)$	0.4126	0.4126
			$\log \delta\tau$	9.8894	9.8866
$\log \sin (N\mp\psi)$	9.9871	9.9875			
$\log \xi$	9.4008 <i>n</i>	9.4008 <i>n</i>	$T+t$	Jan. 27 ^d 11 ^h 31.4	11 31.4
$\log (2)$	9.3879 <i>n</i>	9.3883 <i>n</i>	τ		-42.33 +42.23
			$\delta\tau$		+ 0.78 + 0.77
(1)	+0.0471	+0.0464	Greenwich M. T.,	Jan. 27 10 49.8	12 14.4
(2)	-0.2443	-0.2445	λ		4 44.3 4 44.3
(1)-(2)	+0.2914	+0.2909	Boston M. T.,	Jan. 27 6 5.5	7 30.1

To find δP and P :

$\log \eta_2$	9.2922	$\log \xi$	9.4008 <i>n</i>	(3)	+0.1903
$\log \sin N$	9.9873	$\log \cos N$	9.3775	(4)	-0.0600
$\log (3)$	9.2795	$\log (4)$	8.7783 <i>n</i>	(3)+(4)	+0.1303
	Immersion.	Emersion.		Immersion.	Emersion.
$\log [(3)+(4)]$	9.1149	9.1149	δP	- 0.5	+ 0.5
$\log \text{const.}$	7.3038 <i>n</i>	7.3038	N	76.2	76.2
$\log \tau^2$	3.2532	3.2512	$\mp\psi$	- 0.1	+ 0.1
$\text{colog } \cos \psi$	0.0000	0.0000	const.	0.0	180.0
$\log \delta P$	9.6719 <i>n</i>	9.6699	P	75.6	256.8

Pages 608-610 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 612 contains the *Ephemeris for Physical Observations of the Sun*.

Page 613 contains certain elements referring to the Moon, its equator, and its orbit.

i = the inclination of the Moon's mean equator to the Earth's true equator.

Δ = the distance on the Moon's mean equator from its ascending node on the Earth's true equator to its ascending node on the ecliptic of date.

Ω' = the distance along the Earth's true equator from the true equinox to the ascending node of the Moon's mean equator.

Γ' = the longitude of the perigee of the Moon's orbit, referred to the mean equinox of date.

Ω = the longitude of the ascending node of the Moon's orbit on the ecliptic, referred to the mean equinox of date.

ζ = the Moon's mean longitude, referred to the mean equinox of date.

Pages 614-621 contain the *Ephemeris for Physical Observations of the Moon*. The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xi, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° - longitude) and latitude and the position-angle of

the Moon's axis, C , in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A , at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β , are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by l_{\odot} and b_{\odot} , respectively:

$$\sin A = \sin b_{\odot} \sin \beta + \cos b_{\odot} \cos \beta \cos (l_{\odot} - \lambda)$$

Pages 622–623 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360° . We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 624–625 contain the *Ephemeris for Physical Observations of Mars*. The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P —the position-angle of the axis of rotation measured eastward from the north point of the disk.

A_{\oplus} , A_{\odot} —the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

D_{\oplus} , D_{\odot} —the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot \sigma$ —the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k —the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i —the angle between the Sun and the Earth as seen from the planet.

q —the angular value of the greatest defect of illumination as seen from the Earth.

Q —the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Mean Time of Transit of Zero Meridian* contain the Greenwich Mean Time of every transit of the zero meridian across the actual center of the disk.

Pages 626–629 contain the *Ephemeris for Physical Observations of Jupiter*.

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Transit of Zero Meridian* contains the Greenwich Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

Pages 630-655 contain, concerning the *Satellites of Jupiter*, the diagram of the orbits of Satellites I-V, the times of conjunction of Satellites I-IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of Satellites I-IV together with their configurations.

a, b —the major axis and minor axis, respectively, of the outer ellipse of the outer ring.

B = the Saturnicentric latitude of the Earth referred to the plane of the rings, positive toward the north.

ω —the distance in the plane of the rings from their ascending node on the Earth's equator to their ascending node on the ecliptic.

B' = the Saturnicentric latitude of the Sun referred to the plane of the rings, positive toward the north.

$U + 180^\circ$ = the Saturnicentric longitude of the Sun measured in the plane of the rings from their ascending node on the ecliptic.

Pages 657- 665 contain, concerning the *Satellites of Saturn*, the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phoebe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 666 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 667–668 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 669 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 670–671 contain the *Phænomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page xviii. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0° , $\pm 90^\circ$, or 180° . For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, $\delta \text{ } \varnothing \text{ } \subset \dots \varnothing - 4^\circ 22'$ would be read “Conjunction of Mars with the Moon, Mars, $4^\circ 22'$ to the South.”

These pages contain also the beginning of the seasons; the perihelia and aphelia of the planets, including the Earth; the passage of the planets through the nodes of their orbits upon the ecliptic; and the date of lunar and solar eclipses, with their aspect as seen from Washington.

Pages 672-683 contain the *Positions of Observatories*, together with a list of the authorities from which the positions are obtained. The tabular arrangement is self-explanatory.

Page 684 contains two examples in the computation of lunar distances, which are inserted because lunar distance tables are no longer published.

Pages 685-744 contain a series of tables numbered from I to X.

Table I—For Finding the Latitude by an Observed Altitude of Polaris.

Table II—For converting Sidereal into Mean Solar Time.

Table III—For converting Mean Solar into Sidereal Time.

Table IV—For finding the Azimuth of Polaris at All Hour Angles.

Table V—For finding the Azimuth of Polaris at Elongation.

Table VI—For Finding the Times of Upper and Lower Culmination of Polaris.

Table VII—For finding the Apparent Place, Time of Upper Culmination, and Time Interval between Upper Culmination and Elongation, of Polaris.

Table VIII—For finding the time of Sunrise and Sunset at any place between the equator and 60° north latitude, assuming this to be the instant when the true zenith distance of the Sun's center is $90^\circ 50'$; i. e., when the apparent zenith distance of the Sun's upper limb is $90^\circ, 34'$ having been allowed for horizontal refraction and $16'$ for semidiameter.

Table IX—Sunrise and Sunset for Southern Latitudes.

Table X—For finding the time of Moonrise and Moonset at any place between 60° north latitude and 60° south latitude, assuming this to be the instant when the true geocentric zenith distance of the Moon's center is $90^\circ 50'$ minus the Moon's parallax. Here, as in the case of the Sun, $34'$ has been allowed for horizontal refraction and $16'$ for semidiameter.

INDEX TO APPARENT PLACES OF STARS, 1923. 771

Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Andromedæ.	Aquarii.	Argus.	Boëtis.	Can. Maj.	Cassio.	Ceti.
α 316	b^1 507	ψ 394	f 429	ξ^2 372	36 H. 336	θ 326
β 324	c^2 504	11 425	11 425	σ^2 376	38 327	ι 317
γ 332	\dagger^1 510	33 431	33 431		40 327	μ 338
δ 320				Can. Min.	50 332	ν 336
ϵ 320	Aquilæ.	α 332	Bradley.	α 381	55 333	ξ^1 333
ζ 321	α 476	β 331	1147 385	β 380		ξ^2 336
ι 509	β 477	δ 343	1672 235		Centauri.	\circ 335
κ 510	γ 475	ϵ 340	2777 487	Can. Ven.	α^2 431	π 338
λ 509	δ 472	ζ 343			β 426	σ 336
μ 323	ϵ 469	ν 337			γ 418	τ 329
\circ 503	ζ 469	σ 339	Camelop.	α 420	δ 413	υ 332
π 319	η 476	τ 344	β 358	2 415	ϵ 424	2 513
σ 317	θ 478	41 339	4 356	8 416	ζ 425	12 319
υ 327	κ 474		9 357	17 H. 423	η 431	13 319
ψ 511	λ 470	Aurigæ.	17 362	20 421	θ 427	20 322
22 317	μ 473	α 361	43 374	Capricorni.	ι 422	67 334
	τ 478	β 367	2 H. 346	α^2 479	λ 410	
Antiliæ.	ω 472	δ 367	5 H. 348	β 479	π 409	Chamæleon.
α 401	1 465	ϵ 358	9 H. 349	γ 492	n 419	β 415
θ 396	2 466	ζ 358	19 H. 360	δ 492		δ^2 404
ι 405	6 467	η 359	22 H. 369	ζ 490	Cephei.	ζ 234
		θ 368	23 H. 372	θ 486	α 489	θ 387
Apodis.	Aræ.	ι 357	25 H. 233	ι 489	β 491	π 411
α 432	α 455	λ 361	30 H. 234	μ 493	γ 510	
γ 447	β 454	μ 360	32 H. 235	π 480	ζ 496	Cæli.
δ^1 444	δ 455	ν 366		ρ 480	η 484	α 355
θ 426	ϵ^1 451	\circ 365	Cancr.	υ 482	θ 481	
59 G. 236	θ 461	χ 363	α 391	ψ 483	ι 502	Columbæ.
		ψ^1 370	β 386		κ 479	α 365
Aquarii.	Argus.	ψ^5 374	γ 389	Carinæ.	\circ 506	\circ 361
α 494	α 371	51 372	δ 389	b^1 391	π 504	
β 491	β 393	63 377	ζ 385		11 492	Comæ.
γ 497	γ 385		η 388	Cassio.	20 495	α 470
δ 502	δ 390	Boëtis.	ι 389	α 320	24 496	
ϵ 484	ϵ 386	α 428	κ 392	β 316	39 H. 238	20 416
η 499	η 403	β 435	σ^2 390	γ 323	41 H. 511	24 417
θ 497	θ 403	γ 430	ω 383	δ 326	43 H. 232	31 419
ι 495	ι 393	δ 437	d^1 386	ϵ 330	47 H. 341	43 421
λ 502	λ 392	ϵ 432	83 393	ζ 319	48 H. 344	
μ 485	μ 404	η 425		η 322	51 H. 233	Cor. Austr.
ν 487	ν 373	θ 429	Can. Maj.	ι 335	226 B. 499	α 470
ξ 491	ξ 382	λ 428	α 374	μ 324		Cor. Bor.
π 498	π 378	μ 437	β 370	\circ 321	Ceti.	α 439
σ 498	ρ 384	ν^1 439	γ 377	ρ 512	α 341	β 438
τ 501	σ 380	ρ 430	δ 377	ω 328	β 321	γ 338
υ 499	τ 375	σ 431	ϵ 376	4 507	δ 337	δ 337
ϕ 505	υ 396	τ 424	ζ 369	5 H ¹ . 505	ζ 330	ζ 440
ψ 505	ϕ 398	ψ 435	η 379	21 321	η 324	σ 445
ω^2 510	χ 383	d 427	θ 375			

772 INDEX TO APPARENT PLACES OF STARS, 1923.

Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Corvi.	Doradus.	Eridani.	Groombr.	Horologii.	Leonis.	Lupi.
β 417	α 354	ν 355	1446 388	α 352	ϵ 396	β 434
γ 414	δ 366	σ^1 352	1450 387	μ 342	ζ 399	γ 439
δ 416		τ^2 340	1586 397	38 G. 344	η 398	ζ 436
ϵ 413	Draconis.	τ^3 341	1706 405		θ 408	
		τ^5 347	1830 412	Hydræ.	ι 409	Lyncis.
Crateris.	α 427	τ^6 348	2001 423		μ 397	
	β 456	ν^5 353	2164 433	α 394	ξ 395	2 369
α 406	γ 460	φ 334	2283 236	γ 422	σ 396	8 371
β 407	δ 471	e 345	2320 444	δ 388	π 398	15 376
δ 408	ϵ 476	g 348	2377 450	ϵ 390	ρ 402	24 381
ζ 411	ζ 453	12 343	2533 463	ζ 390	σ 409	26 383
	η 447	53 355	3241 481	θ 392	τ 409	27 384
Crucis.	θ 443		4163 512	λ 399	υ 410	31 386
	ι 438	Fornacis.		μ 401	χ 407	40 393
α^1 415	κ 417			ν 404	d 406	
β 419	λ 410	β 339	Gruis.	ξ 410	l 404	Lyræ.
γ 416	ξ 459	κ 335		π 426	p^4 407	
δ 414	σ 468	μ 334	α 495	σ 388	54 405	α 466
	τ 472		β 500			β 467
	χ 464	Geminor.	γ 493	Hydri.	Leo. Min.	γ 469
Cygni.	ψ 458		ϵ 501			θ 471
	ω 457	α^2 380	ι 504	α 331	10 395	ι 470
α 483	A 448	β 382		β 318	19 398	R 468
β 473	1 H. 234	γ 372	Herculis.	γ 349	31 401	
γ 480	3 411	δ 378		δ 335	41 403	Mensæ.
δ 475	4 H. 414	ϵ 373	α 453	ϵ 337	42 403	δ 353
ϵ 484	9 H. 402	ζ 376	β 448	θ 342	46 405	ζ 233
ζ 488	12 H. 441	η 369	γ 446	ι 345		31 G. 233
θ 474	35 459	θ 375	δ 453	λ 322	Leporis.	
ι 473	36 463	ι 379	ϵ 452	μ 337		
κ 472	50 467	κ 381	ζ 450		α 363	
ν 486	76 237	λ 378	η 450	Indi.	β 362	Microscop.
ξ 487	79 494	μ 370	θ 460		δ 366	
σ 478	220 H ¹ . 485	ν 371	ι 457	α 482	ϵ 359	γ 486
π^2 493		ξ 373	κ 444	β 485	ζ 365	θ^1 489
σ 489	Equulei.	ρ 380	λ 456	ϵ 494	η 367	
τ 488		φ 382	μ 458	ρ 502	μ 360	Monocer.
g 490	α 488	χ 384	ξ 460			
15 475		1 368	σ 462	Iacertæ.	Libræ.	S 373
41 481	Eridani.	51 377	π 454			8 370
61 487			σ 449	α 498	α 433	10 371
74 491	α 328	Groombr.	τ 446	3 498	β 437	18 374
	β 359		φ 444	10 499	γ 439	25 381
Delphini.	γ 350	750 232	ω 447		δ 434	30 387
	δ 347	848 356	d 452	Leonis.	ι 436	
α 482	ϵ 346	944 232	w 454		λ 442	Muscæ.
β 482	ζ 344	966 363	49 451	α 399	ξ^2 434	
γ 484	η 340	1119 234	89 459	β 412	2 429	α 417
δ 483	θ 341	1308 379	109 464	γ 400	8 433	δ 420
ϵ 481	μ 356	1374 383	110 466	δ 408	32 438	

INDEX TO APPARENT PLACES OF STARS, 1923. 773

Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.	Name. Page.
Normæ.	Orionis.	Persei.	Puppis.	Scorpii.	Telescopii.	Urs. Min.
γ^2 445	π^5 357	ρ 342	1 G. 368	τ 449	α 464	α 232
	τ 361	τ 340	4 382	24 449		β 433
Octantis.	φ^1 364	ν 328	20 385		Trianguli.	γ 437
α 486	11 359	φ 329		Sculptoris.	α 330	δ 237
β 238	Pavonis.	c 351	Pyxidis.	α 323	β 333	ϵ 236
γ^1 238		m 354	α 389	β 508	γ 334	ζ 441
δ 236	α 480	6 333	θ 394	γ 506		η 447
ζ 234	β 483	Phœnicis.	Reticuli.	δ 511	Tri. Austr.	λ 237
η 235	γ 490	a 318	α 352	ϵ 330	α 450	4 428
ι 235	ϵ 477	β 324	δ 350	Serpentis.	β 442	5 430
κ 235	ζ 465	γ 326		α 440	γ 436	19 445
λ 238	η 457	ϵ 316	Sagittæ.	β 440		Velorum.
ρ 236	λ 467	μ 320	β 474	γ 442	Tucanæ.	q 399
σ 237	Pegasi.	ψ 331	γ 477	ϵ 441	α 497	Virginis.
ν 238	α 503	Piazz.	δ 476	η 463	γ 506	α 422
χ 237	β 503	221 434	Sagittarii.	θ 468	ϵ 513	β 412
4 G. 232	γ 317	Pictoris.	γ 461	κ 440	ζ 318	γ 418
7 G. 233	ϵ 492	α 375	δ 463	μ 441	κ 325	δ 420
Ophiuchi.	ζ 500	Pisc. Austr.	ϵ 464	ξ 457	Urs. Maj.	ϵ 421
α 456	η 500	α 503	ζ 469	τ^1 438	α 406	ζ 423
β 458	θ 496	ϵ 500	η 462	c 465	β 406	η 415
γ 459	ι 495	3 488	ι 477	3 436	γ 412	θ 421
δ 445	λ 501	Piscium.	λ 465	Sextantis.	δ 414	ι 428
ϵ 446	μ 501	γ 506	μ 462	6 397	ϵ 420	κ 427
ζ 449	π 496	δ 322	π 470	33 402	ζ^1 422	λ 429
η 452	τ 507	ϵ 323	σ 468	Tauri.	η 424	μ 432
θ 454	ν 507	ζ 325	φ 466	α 354	θ 395	ν 413
κ 451	φ 511	η 327	ψ 471	β 362	ι 391	π 418
λ 448	1 490	θ 508	c 478	γ 353	κ 391	ρ 418
ν 460	16 493	ι 509	d 471	δ 353	λ 400	τ 426
σ 455	20 494	κ 508	f 475	ϵ 354	μ 400	φ 430
b 455	31 497	ν 329	h 473	ζ 364	ν 408	χ 418
30 452	55 504	ξ 331	54 474	η 348	σ^2 392	m 424
67 461	59 505	\circ 329	Scorpii.	ι 358	ν 397	70 423
70 461	70 508	π 328	α 448	λ 350	ψ 407	89 425
72 462	72 509	τ 325	β 443	μ 352	χ 411	109 432
Orionis.	Persei.	ν 326	γ 435	ν 351	d 395	Volantis.
a 367	a 345	ω 512	δ 443	ξ 346	h 394	γ^2 378
β 360	β 343	f 325	ϵ 451	\circ 345	3 H. 384	δ 379
γ 362	γ 342	30 513	η 453	τ 355	30 H. 401	Vulpeculæ.
δ 363	δ 347	33 316	ι^1 458	A 351	32 400	24 479
ϵ 364	ϵ 349	44 318	λ 456	f 346	36 402	32 485
ζ 365	ζ 349		π 442	i 357	76 419	
ι 364	η 339		σ 446	p 351		
κ 366	θ 338					
ν 368	ν 347					
π^3 356	ξ 350					

GENERAL INDEX.

	Page.
Abbreviations	xviii
Aberration, Constant of	xvi
of the Sun	3
Achernar (Alpha Eridani), Apparent Place	328
Mean Place	217
Age of the Moon	118
Alcyone (Eta Tauri), Apparent Place	348
Mean Place	219
Aldebaran (Alpha Tauri), Apparent Place	354
Mean Place	219
Algol (Beta Persei), Apparent Place	343
Mean Place	218
Alioth (Epsilon Ursæ Majoris), Apparent Place	420
Mean Place	224
Alkaid (Eta Ursæ Majoris), Apparent Place	424
Mean Place	224
Alpha Canis Majoris (Sirius), Apparent Place	374
Mean Place	221
Orbit Position	x
Parallax	ix
Alpha Canis Minoris (Procyon), Apparent Place	381
Mean Place	221
Orbit Position	x
Parallax	ix
Alpha Centauri, Apparent Place	431
Mean Place	225
Orbit Position	x
Parallax	ix
Alpha Ursæ Minoris (Polaris), Apparent Place	232, 709
Mean Place	231
Polaris Tables	685
Alpheratz (Alpha Andromedæ), Apparent Place	316
Mean Place	217
Altair (Alpha Aquilæ), Apparent Place	476
Mean Place	228
Parallax	ix
Anniversaries and Festivals	xiv
Antares (Alpha Scorpii), Apparent Place	448
Mean Place	226
Aphelia of Planets	670
Apogee of Moon	117
Apparent Place of 2 Aquilæ, Example of Reduction to	752
Places of 790 Standard Stars	316
of 35 Circumpolar Stars	232
of 825 Stars, Index to	771
Arcturus (Alpha Boötis), Apparent Place	428
Mean Place	224
Ariel, First Satellite of Uranus	666, 667, 668

	Page.
Arrangement and Use of the American Ephemeris	745
Aspects of the Planets	670
Astronomical Constants	xvi
Azimuth of Polaris at all Hour Angles, Table IV	697
at Elongation, Table V	702
Beginning of the Seasons	670
Bellatrix (Gamma Orionis), Apparent Place	362
Mean Place	220
Besselian Elements of Solar Eclipses	558, 560
Formulae for Star Reductions	200
Star Numbers	202, 214
Example of Reduction with	752
Exclusive of short-period Terms	214
Betelgeux (Alpha Orionis), Apparent Place	367
Mean Place	220
Brilliancy of the Planets, greatest (see Stellar Magnitude under each planet).	
Canopus (Alpha Argus), Apparent Place	371
Mean Place	220
Capella (Alpha Aurigæ), Apparent Place	361
Mean Place	220
Castor (Alpha Geminorum), Apparent Place	380
Mean Place	221
Charts of Solar Eclipses	following pages 558, 560
Chronological Eras and Cycles	xv
Circumpolar Stars, Apparent Places	232
Mean Places	231
Conjunctions of Planets	670
Constants, Astronomical	xvi
Culminations, Moon	522
of Polaris, Table VI for finding times of	708
Upper Culmination, Meridian of Greenwich, Table VII	709
Cygni 61, Apparent Place	487
Mean Place	229
Parallax	ix
Day, Civil and Astronomical	746
Length of	xvi
of Julian Period	xv
Delta Cassiopeiæ, Apparent Place	326
Mean Place	217
Used for finding time of culmination of Polaris (Table VI)	708
Deneb (Alpha Cygni), Apparent Place	483
Mean Place	228
Denebola (Beta Leonis), Apparent Place	412
Mean Place	223
Dione, Fourth Satellite of Saturn	657, 660, 662, 664
Disk of Mercury	622
of Venus	623
Distance, Astronomical Unit of	xvi
of the Moon	xvi
of the Planets (see also reference under each planet)	xvii
of the Sun	xvi, 3
Dominical Letter	xv
Earth, Dimensions of	xvi
Elements of Orbit of	xvii
Earth's Radius Vector, Logarithm of	3
Easter, Date of	xiv

	Page.
Eccentricities of the Orbits of the Earth and Planets	xvii
Eclipses, Solar and Lunar, Elements and Circumstances of	556
Solar, Besselian Elements of	558, 560
Charts of	following pages 558, 560
Correction to Elements of	x
Example of the Computation of	761
Ecliptic, Obliquity of	3
Election Day, Date of	xiv
Elements of Planetary Orbits	xvii
Elongations of Planets	670
Elongation, Azimuth of Polaris at, Table V	702
of Polaris, Time Interval from Upper Culmination, Table VII	709
Enceladus, Second Satellite of Saturn	657, 659, 662, 664
Epact	xv
Ephemeris for the Meridian of Greenwich (Part I)	1-198
of Washington (Part II)	199-553
Equation of time for Greenwich Mean Noon	2
for Washington Apparent Noon	514
Equator, Moon's	613
Equinoxes, Date of	670
Errata	vi
Example of the Computation of Lunar Distances	684
of Occultations	766
of Solar Eclipses	761
Reduction of Stars to Apparent Place	752
of the Sun	748
Festivals, etc.	xiv
Fomalhaut (Alpha Piscis Australis), Apparent Place	503
Mean Place	230
Geocentric Ephemerides of the Planets	134
Latitude of Observatories, Reduction to	672
Golden Number	xv
Gravity, Acceleration due to	xvi
Gaussian, Constant of	xvi
Greenwich Ephemeris (Part I)	1-198
Hayford's Spheroid	xvi
Heliocentric Coordinates of the Planets	142
Hyperion, Seventh Satellite of Saturn	657, 660, 663, 665
Iapetus, Eighth Satellite of Saturn	657, 660, 663, 665
Independent Star-Numbers	206, 214
Example of Reduction with	753
Exclusive of short-period Terms	214
Formulae for	200
Irradiation	xi
Julian Period	xv
Jupiter, Diameter, Apparent Equatorial	627
Distance from Earth, logarithm of	174
Elements of Orbit of	xvii
Ephemeris for Physical Observations of	626
Elements used	xii
Greenwich, Transit of	174
Heliocentric Longitude and Latitude of	182
Horizontal Parallax of	174, 546
Radius Vector (Distance from Sun), logarithm of	182

	Page.
Jupiter, Reduction to Orbit	182
Right Ascension and Declination at Greenwich Mean Noon	174
at Washington Transit	546
Satellites, Diagram of Apparent Orbits of, Synodic Periods of	630
I, II, III, and IV, Phenomena and Configurations of	634
Times of Superior Conjunction of	631
Satellite V, Greatest Elongation of	631
Satellites VI and VII, Differential Coordinates of	633
Semidiameter, Adopted Constant of	xvii
Polar	174, 546
Sidereal Time of, Passing Meridian	546
Stellar Magnitude of	546, 626
Washington Transit of	546
Latitude, for finding, by an Observed Altitude of Polaris, Tables I, Ia	685
Formula for Reduction to Geocentric	xvi
Heliocentric, of the Planets	142
of the Moon	118
Corrections to	x
of the Sun	3
Length of the Day	xvi
of the Month	xvi
of the Seconds Pendulum	xvi
of the Year	xvi
Libration of the Moon	614
Light, Velocity of	xvi
Longitude, Heliocentric, of the Planets	142
Mean, of the Moon	613
Nutation in	3
of the Sun	3
of the Moon, Corrections to	x
Precession in	3
Short-Period Terms of Nutation in	215
True, of the Moon	118
Lunar Distances, Examples in	684
Magnitudes, Stellar, of Jupiter	546, 626
of Mars	624
of Mercury	622
of Neptune	552
of Saturn	548, 656
of Uranus	550
of Venus	623
Maps of Solar Eclipses	following pages 558, 560
Markab (Alpha Pegasi), Apparent Place	503
Mean Place	230
Mars, Distance from Earth, logarithm of	162
Elements of Orbit of	xvii
Ephemeris for Physical Observations of	624
Elements used	xii
Greenwich Transit of	162
Heliocentric Longitude and Latitude of	170
Horizontal Parallax of	162
Occultation of	570
Radius Vector (Distance from Sun), logarithm of	170
Reduction to Orbit	170
Right Ascension and Declination at Greenwich Mean Noon	162

	Page.
Mars, Semidiameter, Adopted Constant of	xvii
Apparent	162
Stellar Magnitude of	624
Mass of Planets	xvii
Mean Places of 790 Standard Stars	217
of 35 Circumpolars	231
of Stars Occulted by the Moon	564
Mean Solar into Sidereal Time, Table III	693
Mercury, Apparent Disk of	622
Distance from Earth, logarithm of	134
Elements of Orbit of	xvii
Greenwich Transit of	134
Heliocentric Longitude and Latitude of	142
Horizontal Parallax of	134, 538
Radius Vector (Distance from Sun), logarithm of	142
Reduction to Orbit	142
Right Ascension and Declination at Greenwich Mean Noon	134
at Washington Transit	538
Semidiameter, Adopted Constant of	xvii
Apparent	134, 538
Sidereal Time of, Passing Meridian	538
Stellar Magnitude of	622
Washington Transit of	538
Meridian Passage of Jupiter	174, 546
of Mars	162
of Mercury	134, 538
of Moon	118, 522
of Neptune	196, 552
of Saturn	184, 548
of Sun	514
of Uranus	193, 550
of Venus	150, 542
Mimas, First Satellite of Saturn	657, 658, 662, 664
Mira (Omicron Ceti), Apparent Place	335
Mean Place	218
Mizar (Zeta Ursæ Majoris), Apparent Place	422
Mean Place	224
Used for finding time of Culmination of Polaris (Table VI)	708
Month, Length of	xvi
Moon, Age of, Greenwich Mean Noon and Midnight	118
Apogee and Perigee	117
Bright Limbs	522
Corrections to the Long., Lat., and Hor. Parallax of the	x
Culminations, upper and lower, Meridian of Washington	522
Distance from Earth, Mean	xvi
Eclipses of, Elements and Circumstances	556
Ephemeris for Physical Observations of	614
Formula used	xi
Hourly	26
Equator, Position of	613
Libration, Formulæ for computing	xii
Longitude and Latitude of	118
Formulæ for	vii
Longitude, Mean	613
True	118

	Page.
Moon, Motion of, in Mean Longitude	613
Node, Mean Longitude of	613
Parallax for Greenwich Noon and Midnight	118
for Washington, upper and lower transit	522
Mean Equatorial Horizontal	xvi
Perigee and Apogee	117
Perigee, Mean Longitude of	613
Phases of	117
Right Ascension and Declination for each Hour	26
for Washington upper and lower Transit	522
Semidiameter, Adopted Constant of	xi, xvii
Apparent	118, 522
Sidereal Time of, Passing Meridian	522
Transit, upper and lower, at Greenwich	118
at Washington	522
Moonrise and Moonset, Table X	728
Neptune, Distance from Earth, logarithm of	196
Elements of Orbit of	xvii
Greenwich Transit of	196
Heliocentric Longitude and Latitude of	198
Horizontal Parallax of	196, 552
Radius Vector (Distance from Sun), logarithm of	198
Reduction to Orbit	198
Right Ascension and Declination at Greenwich Mean Noon	196
at Washington Transit	552
Satellite, Diagram of Apparent Orbit of	669
Sidereal Period of	669
Tables for Determining Position Angle and Distance of	668
Times of elongation of	669
Semidiameter, Adopted Constant of	xvii
Apparent	196, 552
Sidereal Time of, Passing Meridian	552
Stellar Magnitude of	552
Washington Transit of	552
Node, Mean Longitude of the Moon's	613
Nutation, Constant of	xvi
Formulae for	viii
Terms of Short Period in the	215
in Longitude	3
Oberon, Fourth Satellite of Uranus	666, 667, 668
Obliquity of the Ecliptic, True	3
Mean	xvi
Short-Period Terms of Nutation in	215
Observatories, Positions of, etc.	672
Occultations, Elements for Prediction of	568
Example of Computation of	766
Mean Places of Stars	564
Visible at Washington	608
Opposition of Planets	670
Orbits of the Planets, Elements of	xvii
Orbit Positions of Sirius, Procyon, and α^2 Centauri	x
Parallax, Annual, of τ Ceti, ϵ Eridani, Sirius, Procyon, α Centauri, Altair, and 61 Cygni	ix
Corrections to, of the Moon	x
Horizontal, of Jupiter	174, 546
of Mars	162

	Page.
Parallax, Horizontal, of Mercury	134, 588
of Moon	xvi, 118, 522
of Neptune	196, 552
of Saturn	184, 548
of Sun	2
of Uranus	193, 550
of Venus	150, 542
Solar, Constant of	vii, xvi
Pendulum, Length of Seconds	xvi
Perigee of the Moon	117
Longitude of Moon's	613
Perihelia of Planets	xvii, 670
Phases of Eclipses of Jupiter's Satellites	635
of the Moon	117
Phenomena, Eclipses, Occultations, Satellites, etc., Part III	555
of Jupiter's Satellites	634
Planetary Configurations	670
Phœbe, Ninth Satellite of Saturn	657, 661
Physical Observations of Jupiter, Ephemeris for	626
of Mars, Ephemeris for	624
of the Moon, Ephemeris for	614
of the Sun, Ephemeris for	612
Planetary Configurations	670
Orbits, Elements of	xvii
Planets, Aspects of	670
at Greatest Brilliancy (see Stellar Magnitude under each planet).	
at Stationary Points	670
in Ascending and Descending Node	670
in Conjunction	670
in Elongation	670
in Opposition	670
in Perihelion and Aphelion	670
in Quadrature	670
Semidiameters of	xvii
Signs of	xviii
Polaris (Alpha Ursæ Minoris), Apparent Place	232, 709
Azimuth of, at All Hour Angles, Table IV	696
Azimuth of, at Elongation, Table V	702
for Finding the Times of Upper and Lower Culminations from Observations in Connection with Zeta Ursæ Majoris (Mizar), S. P. and Delta Cassiopeiæ, S. P., Table VI	708
Mean Place	231
Table I, for Determining Latitude by Observations of Polaris	685
Time of Upper Culmination, and Time interval between Upper Culmination and Elongation, Table VII	709
Pole Star (see Polaris).	
Pollux (Beta Geminorum), Apparent Place	382
Mean Place	221
Precession, General	xvi
in Longitude	3
Procyon (Alpha Canis Minoris), Apparent Place	381
Mean Place	221
Orbit Position	x
Parallax	ix
Quadrature of Planets	670

	Page.
Radius Vector of the Earth, logarithm of	3
of the Planets, logarithm of	142
Reduction of Sidereal to Solar Time, and <i>vice versa</i> , Tables II, III	690
of Stars to Apparent Place, Formulæ for	200
Example of	752
Regulus (Alpha Leonis), Apparent Place	399
Mean Place	222
Rhea, Fifth Satellite of Saturn	657, 660, 663, 665
Rigel (Beta Orionis), Apparent Place	360
Mean Place	220
Rings of Saturn	656
Roman Indiction	xv
Satellites of Jupiter	630
of Neptune	668
of Saturn	657
of Uranus	666
Saturn, Distance from Earth, logarithm of	184
Elements of Orbit of	xvii
Greenwich Transit of	184
Heliocentric Longitude and Latitude of	192
Horizontal Parallax of	184, 548
Occultations of	569, 572, 575, 578, 581, 583, 586, 589, 592, 595
Radius Vector (Distance from Sun), logarithm of	192
Reduction to Orbit	192
Right Ascension and Declination at Greenwich Mean Noon	184
at Washington Transit	548
Rings, Elements for Determining Geocentric Position of	656
Satellites, Diagram of Apparent Orbits of	657
Differential Coordinates of Phœbe	661
Greatest Elongations of	658
Names of	657
Synodic Periods of	657
Tables for Determining Position Angle and Distance	662
Semidiameter, Adopted Constant of	xvii
Apparent Polar	184, 548
Sidereal Time of, Passing Meridian	548
Stellar Magnitude of	548, 656
Washington Transit of	548
Schedir (Alpha Cassiopeïæ), Apparent Place	320
Mean Place	217
Seasons, Beginning of	670
Semidiameter of Jupiter	174, 546
of Mars	162
of Mercury	134, 538
of Moon	118, 522
of Neptune	196, 552
of Saturn	184, 548
of Sun	2, 514
of Uranus	193, 550
of Venus	150, 542
Semidiameters of the Sun and Moon, Adopted Constants of	xi, xvii
of the Planets, Adopted Constants of	xvii
Short-Period Terms of Nutation	215
in Star Numbers	200
Sidereal into Mean Solar Time, Table II	690
Noon, Greenwich Mean Time of	3
Time of Washington Mean Noon	514
Sidereal Time or Right Ascension of Mean Sun	2

	Page.
Signs of the Zodiac	xviii
Sirius (Alpha Canis Majoris), Apparent Place	374
Mean Place	221
Orbit Position	x
Parallax	ix
Solar Cycle	xv
Ephemeris	2, 514
into Sidereal Time, Table III	693
Solstices	670
Spheroid, Hayford's	xvi
Spica (Alpha Virginis), Apparent Place	422
Mean Place	224
Stars, Apparent Places of 790 Standard	316
of 35 Circumpolar	232
Elements of Occultations	568
Example of Reduction to Apparent Position	752
Formulæ for Reduction to Apparent Position	ix, 200
Index to the Apparent Places	771
Mean Places for beginning of the Year, of 790 Standard	217
of 35 Circumpolar	231
of Stars Occulted by the Moon	564
Occultations visible at Washington	608
Star Numbers, Besselian and Independent, omitting short-period terms	214
Besselian, including short-period terms	202
Formulæ used in Computing	viii, 200
Independent, including short-period terms	206
Sun, Aberration of	3
Constant of	xvi
Coordinates, rectangular	18
Formulæ for	vii
Distance from Earth, Mean	xvi
Distance from Earth at Gr. Mean Noon, logarithm of	3
Eclipses of, Charts	following pages 558, 560
Elements and Circumstances of	556
Example of Computation of	761
Ephemeris for Physical Observations of	612
Formulæ used	xi
Examples in the Reduction of	748
Longitude and Latitude, Greenwich Mean Noon	3
Mean, R. A. of, at Greenwich Mean Noon	2
Parallax, Constant of	vii, xvi
Horizontal	2
R. A. and Decl. at Greenwich Mean Noon	2
at Washington Apparent Noon	514
Semidiameter, Adopted Constant of	xi, xvii
Apparent	2, 514
Sidereal Time of, Passing Meridian	514
Sunrise and Sunset for Northern Latitudes, Table VIII	710
for Southern Latitudes, Table IX	726
Symbols and Abbreviations	xviii
Synodic Month, Length of	xvi
Periods of the Planets	xvii
Terms of Short Period in the Nutation	215
Tethys, Third Satellite of Saturn	657, 659, 662, 664
Thanksgiving Day, Date of	xiv
Time, Equation of, at Greenwich Mean Noon	2
at Washington Apparent Noon	514

	Page.
Time, Mean, of Greenwich Sidereal Noon	3
Precepts for Conversion of	746
Sidereal, of Greenwich Mean Noon	2
of Washington Mean Noon	514
Tables for Conversion of Sidereal to Solar and <i>vice versa</i> , Tables II and III	690
Titan, Sixth Satellite of Saturn	657, 660, 663, 665
Titania, Third Satellite of Uranus	666, 667, 668
Transit of the Moon	118, 522
of the Planets	134, 538
Tropical Year, Length of	xvi
Umbriel, Second Satellite of Uranus	666, 667, 668
Unit of Distance, Astronomical	xvi
Uranus, Distance from Earth, logarithm of	193
Elements of Orbit of	xvii
Greenwich Transit of	193
Heliocentric Longitude and Latitude of	195
Horizontal Parallax of	193, 550
Occultations of 582, 585, 588, 591, 594, 597, 599, 602, 605, 610	195
Radius Vector (Distance from Sun), logarithm of	195
Reduction to Orbit	195
Right Ascension and Declination at Greenwich Mean Noon	193
at Washington Transit	550
Satellites, Diagram of Apparent Orbits of	666
Greatest Elongations of	666
Sidereal Periods of	666
Tables for Determining Position Angle and Distance of	667
Semidiameter, Adopted Constant of	xvii
Apparent	193, 550
Sidereal Time of, passing Meridian	550
Stellar Magnitude of	550
Washington Transit of	550
Vega (Alpha Lyrae), Apparent Place	466
Mean Place	227
Venus, Apparent Disk of	623
Distance from Earth, logarithm of	150
Elements of Orbit of	xvii
Greenwich Transit of	150
Heliocentric Longitude and Latitude of	158
Horizontal Parallax of	150, 542
Occultations of	569, 582
Radius Vector (Distance from Sun), logarithm of	158
Reduction to Orbit	158
Right Ascension and Declination at Greenwich Mean Noon	150
at Washington Transit	542
Semidiameter, Adopted Constant of	xvii
Apparent	150, 542
Sidereal Time of, passing Meridian	542
Stellar Magnitude of	623
Washington Transit of	542
Washington Ephemeris (Part II)	199-553
Year, Length of	xvi
Zeta Ursæ Majoris (Mizar), Apparent Place	422
Mean Place	224
Used for finding time of Culmination of Polaris, Table VI	708
Zodiac, Signs of	xviii

